The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Contents

NOTICES :—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Moral of the Election

THE Election is over, and quite apart from the result is the relative position of parties, which has nothing to do with us, there are results of another kind which are all-important from the business point of view. The Election may be regarded as the real end of the War. History will record that the Great War was followed by a hurried Election and a War Government, and that it took this country four long years to shake off the habit of thinking in terms of war. The present Election has been fought almost entirely on domestic issues—often on local issues—in any case on issues which were very confused, but certainly not on questions arising out of the War. Industry can, therefore, breathe again in the comforting knowledge that at last the War has ceased.

Equally important is the fact that the Election has brought us back to party Government; we are still a long way from the old ideal of the two-party system; there are five or six so-called parties which claim the allegiance of a section of the members of the House. The two-party system which has prevailed right through a century of intense British industrial and social development, will, it is to be hoped, come back to us, and thus re-establish that balance in political matters which was at the foundation of British stability. We are not quite there yet, but it is something to have secured general agreement in all parties to the principle of party Government.

Another pleasing feature of this week's Election was the absence of excitement. Coolness, which amounted almost to apathy, characterised the manner in which most people cast their votes. There was, of course, a certain amount of heat in some districts, but, taken as a whole, the country did not give itself over to the excitement of electioneering in the manner of the Gladstone-Salisbury days. We interpret this to mean that politics are going to be at a discount; that people are beginning to realise that they must look in other directions for the satisfaction of their needs and aims: and we see the business man coming back into his own. There has been far too much tendency in the recent past to imagine that we could live on politics.

Accident Risks in Chemical Works

WHEN we find ourselves in conversation with chemical engineers and works managers who are in constant touch with the conduct of industrial operations we usually take advantage of the opportunity to glean some information as to the number of accidents which occur nowadays as compared with a decade ago. The general impression one gathers is that the ordinary process worker is growing far more alive to the variety of potential risks to which he is exposed, and that when regulations are drawn up for his protection he exhibits a good deal of respect for them. In the past the matter was treated largely with indifference, and it has not been an altogether easy task to alter the psychology of the average unskilled labourer and make him use his head as well as his hands. There can be no question, however, that the safety-first principles have begun to sink in, so that the idea of preventing accidents by education has at least commenced to justify itself. In America, of course, the study of accident occurrence and prevention has almost developed into a science, so much so that some of the larger establishments now employ their own "safety engineer." A good deal about the type and frequency of accidents on chemical works was heard at the recent meeting in America of the National Safety Council, where it was pointed out that under normal conditions the accidents which may be classed as truly chemical average less than 25 per cent. of the total. Despite this fact, the severity of injuries in chemical works in America runs higher than the average of other industries, and an attempt has been made to analyse the cause. Mr. W. G. Whitman, of Massa-

chusetts Institute of Technology, has stated that the most logical answer is to be found in the layout and condition of buildings and equipment. In many cases the materials handled or fumes from them are corrosive to a greater or lesser degree on any structural material that may be employed. Extreme examples occur in acid manufacture where the manager may be obliged practically to replace his whole plant every two years. Such conditions invite accidents at every turn, and continuous care and precautions are required by the management and the workman.

What happens, in effect, is that the nature of the operations carried on gives rise to a gradual weakening of some structure or other, and when collapse occurs the cause is not attributed to a purely chemical effect. Accordingly, the safety engineer classifies most of his accidents as non-chemical. The only sure way in which to eliminate risk is, of course, by the introduction of a system involving periodical inspections, foreman's reports, and regular upkeep and replacements. We have remarked on previous occasions that in this country our chemical works are scarcely a model of engineering skill, and in the way of layout and working conditions they are not all that a safety engineer would desire. Albeit, so far as accidents are concerned, we have undoubtedly progressed; and if we bear in mind the point which Mr. Whitman makes we might most probably eliminate a large proportion of those common everyday accidents which are so difficult to account for.

The October Trade Returns

THE Board of Trade Returns for October taken as a whole are extremely good reading. The daily Press, which is never at its best when dealing with trade and commercial matters, fails altogether to bring out the real purport of the figures which are issued from month to month on our imports and exports and re-exports. The *Westminster Gazette*, which is a typical example, tells us that there has been a "big drop in exports." This scare is supposed to be justified by a decrease in value for the month, of £1,800,000. The exports for October amounted in value to well over sixty millions, whereas those for October, 1921, were sixty-two millions. The decrease in values is, therefore, somewhere in the neighbourhood of 3 per cent. Our contemporary does not seem to appreciate that with prices sometimes as much as 100 per cent. below last year, and seldom less than 20 per cent. below, a decrease in values of 3 per cent. corresponds to a very considerable increase in quantity. We are in the position of a shopkeeper who is bringing his prices down to meet the new conditions, and has the intense satisfaction of finding that his turnover is not materially decreased. Exactly the same forces are at work with our imports as with our exports. With prices very much lower we spend roughly the same amount as a year ago, which means, of course, that we have secured a great deal more for our money. Along those lines future prosperity is assured, and there is, therefore, every reason for congratulation on the remarkable figures which October discloses in the matter of exports.

The gradual revival of trade is nowhere better illustrated than in the monetary conditions. The scarcity of money is beginning to be felt in Lombard Street; bankers are experiencing the effect of increased trading activity; the experience of the bankers is the experience of every trading concern. Money is not so easy as it was, and most business men are very thankful that the change has come. For years past we have all been embarrassed by the plethora of money, the surest sign of the absence of trade. The truth is that wherever one turns the trading position is better. There is still, of course, plenty of room for improvement; we have a long way to go to get to anything that could be classed as real prosperity: but the bottom of the curve has been passed, the movement is upward. It would be a great advantage if the daily Press would take the trouble to study these matters and give the general reader a correct impression, because, if the public once absorbed the idea that trade is on the mend, a really big improvement would at once become apparent. So long as the general idea prevails that things are bad, the public will not spend freely, but once that notion is reversed the purse-strings of the multitude will be looser.

The Work of the Food Board

THE recently issued report of the Food Investigation Board (H.M. Stationery Office: 2s.), formed to organise and control research into the preparation and preservation of food products by cold storage and other means, is a valuable document. It contains an interesting account of the activities of the various Committees and records the establishment of a Low Temperature Research Station at Cambridge. There can be no doubt that the equipment of such stations under national auspices was urgently needed, and we may anticipate that we shall shortly be in possession of greatly increased knowledge regarding the storage of food products, thereby aiding the industrial development of food preservation methods on right lines. Results of much value have indeed already been published in these reports, of which the present one is the fourth of the series.

The Fish Preservation Committee of the Board has been largely concerned with an investigation into the bacteriology of "pink" in dried salted fish, of which condition there appear to be two or three varieties. One type of pink growth is due to a coccus (*Rhodococcus*) which infects the salt used in curing. A design for a brine-freezing apparatus suitable for use on trawlers at sea has been completed. Under the direction of the Meat Committee, workers have continued experiments upon the effects of low temperatures on the production of lactic acid in muscle. Other researches have shown that muscle possesses the power of synthesising hexose-phosphate from glucose and sodium phosphate. A study of the effect of the rate of freezing on the autolysis of beef has shown that the more rapid the freezing the more closely does the subsequent autolysis approach that of normal unfrozen beef. This work will assume some importance now that investigations can be commenced under modern conditions of cold storage in the new building at Cambridge. It is significant that the small amount of succinic acid present in muscle is being related to the work done by Professor Gowland Hopkins on tissue-oxidations, reference to which was made in a

recent issue of this journal. An important contribution to our knowledge of the mould-fungi found in cold stores has been completed by F. T. Brooks. Two of the most common moulds found in these stores are new species—*Sporotrichum carneolum* and *Torula botryoides*. A full account of this work will shortly be published separately.

The Engineering Committee has devoted itself to inquiries into the properties of carbon dioxide—which is the agent used in the newly installed machine at the Cambridge laboratory—as a refrigerant, in preference to an ammonia machine, owing to the probable toxic action of small quantities of ammonia on fruit or other living substances. Other work relates to the thermal conductivity of heat insulators in connection with cold storage; the transmission of heat by radiation and convection; the development of industrial types of hygrometers; and the use of an ethyl chloride machine for refrigerator barges on rivers. The Fruit and Vegetables Committee has caused exhaustive researches to be made into the whole physiology of apples, and as a result it appears that (1) apples are best stored at a temperature of 1° C.; (2) the loss below a critical temperature of about 3° C. is almost wholly due to diseases due to physical surroundings and not to infection by moulds; (3) of the six types of soil from which the tested apples were gathered, the order of superiority, whether for ordinary or cold storage, is silt, clay (grassland), greensand, chalk, clay (open ground), fenland. This important work is dealt with at some length in the Report (pp. 14-28) and should be studied by those specially interested.

The Oils and Fats Committee has continued work on the nature and constitution of the acids occurring in natural fats, and the conditions affecting the formation of fat by yeast have been elucidated. The greater part, if not all, of the fat produced by the yeast plant comes from the carbohydrate present in the cultures, as the weight of protein which disappears from the yeast is considerably less than the weight of fat formed. An investigation into the simpler carbon compounds which can replace the carbohydrates as fat-formers is said to be leading to interesting results. The Canned Foods Committee has recently published the work of Dr. W. G. Savage and his collaborators on the bacteriology of canned meat and fish. It has been found that minute leaks in tins result in spoilage chiefly owing to the access of oxygen, and not because they permit of the entry of bacteria to the contents. Other results show the comparative insterility of these classes of canned foods, and it is obvious that from this work deductions of great practical importance may now be made in connection with the canning of meat and fish products. The ripening of fish in cans is also undergoing investigation, as is the question of the solution of tin from the containers by canned herrings in tomato purée. The various Committees responsible under the Board for the planning out of the vast scheme of work here only briefly outlined are to be heartily congratulated on the valuable results already obtained and upon the foresight with which these schemes for research have been elaborated. A full bibliography, given at the end of each section of the Board's work, materially enhances the value of the Report.

Some Election Results

In the new Parliament chemical industry will be less directly represented than in the old. Both Sir E. A. Brotherton (Wakefield) and Mr. W. J. U. Woolcock (Central Hackney) voluntarily retired. Among the candidates who failed were Sir John Brunner (Southport), Sir W. Edge (Bolton), Mr. J. W. Wilson (Stourbridge), Mr. J. C. Nicholson (West Ham, Upton), and Sir William Pearce (Limehouse). Sir Alfred Mond has been returned for Swansea, Dr. G. C. Clayton for Widnes (defeating Mr. Arthur Henderson, the well-known Labour leader), Mr. Vaughan Morgan for Fulham, Sir R. B. Bird for Wolverhampton, Sir Frank Sanderson for Darwen, and Mr. C. S. Garland for South Islington. Of the members who took an active interest in the dyestuffs controversy Lieut.-Commander Astbury was re-elected for West Salford, while Sir William Barton was defeated in the Manchester Exchange division and Major Barnes in East Newcastle. It is of interest to note that Mr. Ramsay Macdonald, whose return for a Welsh constituency adds to the Labour party's debating resources in the House, was in his early days an analytical chemist in London, and that Mr. A. Hayday, the Labour member for West Nottingham, has been a worker in the chemical trade.

Points from Our News Pages

In the third of his Chemical Age letters from America, Mr. F. E. Hamer describes a visit to the essential oil works of Antoine Chiris (p. 700).

The hearing of a complaint that oxalic acid has been improperly included in the list of dutiable articles under (Safeguarding of Industries Act) was commenced on November 11 and continued on Thursday (p. 702).

A commercial process for the de-watering of peat by pressure was described by Professor Hinchley at a meeting of the Chemical Engineering Group (p. 704).

A survey of the history of rosin chemistry was given by Mr. C. F. Soane, F.I.C., at a meeting of the Oil and Colour Chemists' Association (p. 707).

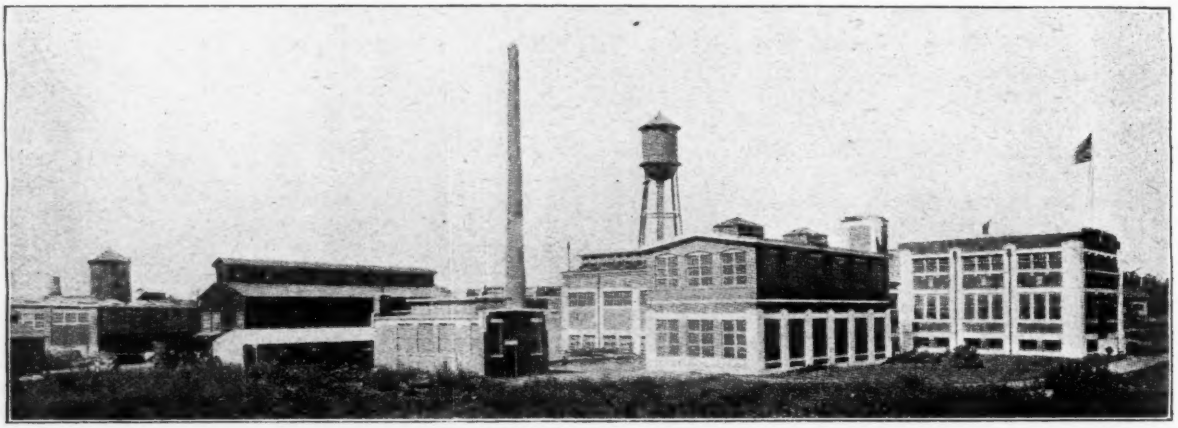
According to the Board of Trade Returns for October, exports of chemicals and dyes were £143,000, and imports £66,000 lower than the September totals (p. 708).

A fair volume of business on home account is recorded in our London Market report, with reductions in English manufacturers' prices (p. 717.).

According to our Scottish Market Report inquiries have been numerous, although the actual business put through was not remarkable (p. 719).

The Calendar

Nov.		
20	Institution of Rubber Industry. A. F. Baillie.	Midland Hotel, Manchester.
20	Chemical Industry Club. O. F. C. Bromfield. 8 p.m.	2, Whitehall Court, London, S.W.1.
23	Royal Society. Papers by Dr. T. E Stanton, Prof. F. A. Lindemann and others.	London.
24	Chemical Industry Club. Annual Dinner.	Connaught Rooms, Kingsway, W.C.
24	Institute of Chemistry (Huddersfield Section). Dr. H. T. Calvert.	Huddersfield.
27	University of Birmingham Chemical Society. "Some Chemical Aspects of Agriculture." E. Holmes.	Birmingham.
27	Royal Society of Arts. "Brown Coal and Lignites." W. A. Bone. 8 p.m.	John Street, Adelphi, London.
20-25	Manchester Chemists' Exhibition. 11 a.m.–3 p.m.	City Hall, Deansgate, Manchester.



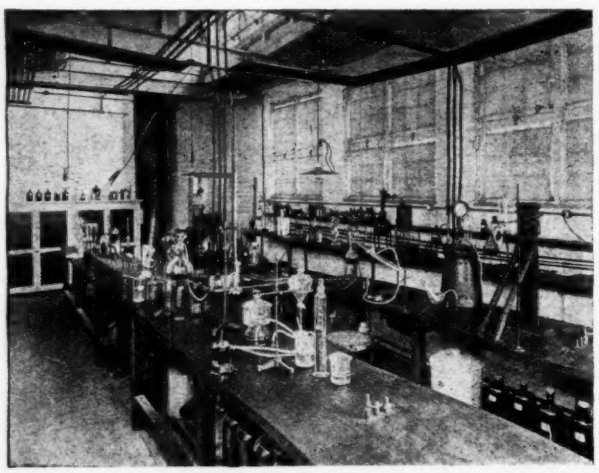
The Chiris Works, Delawanna

"Chemical Age" Letters from America.—III.

The Fine Chemical Industry—A Typical War-Time Enterprise—Consumers' Change of Attitude

Delawanna, New Jersey.

BEFORE leaving this industrial district—where that troublesome little fellow the mosquito seems to enjoy himself greatly at the expense of mankind—it may be interesting, following what was said in the previous letter on the question of the fine chemical industry, to give a brief account of a typical enterprise in this field. Here, within a stone's throw of the railway station, are the American works of the Antoine Chiris Company, the well-known French firm, which was established at Grasse early in 1768 for the distillation of oils from the plants and flowers growing so freely in the surrounding country. The firm has an interesting history. Leon Chiris, the elder of the founder's sons, greatly developed the industry. He purchased at Boufarik, Algeria, an estate of 18,000 acres, where he proceeded with the cultivation of geraniums, orange trees, eucalyptus, verbena, cyprus and roses. He built a factory which has since become the largest and most important there. He is said to have been the first to adopt steam boilers for the distillation of natural perfume oils, a radical change from the employment of direct-fired stills for the handling of such delicate products. Living in a country with the atmosphere impregnated with the odour of flowers, and appreciating that something should be done whereby the fragrant properties of those flowers could be extracted and sent to the perfumer without the chance of their becoming rancid before they were used, and without the possibility of destroying the fine aromatic principles contained in the flowers themselves, he began experimenting with volatile solvents of every description, in order to retain certain delicate esters which he thought were lost by the old method, which required heat. His long experience in the manufacture of pomades had many times suggested to him that, while the price per kilo of the pomades was low, these pomades represented a large quantity of edible fats, shipment of which was expensive, and the possibility of their remaining sweet was uncertain. After experimenting for some time with many volatile substances, his attention was directed to a man named Massignon, then living in Cannes, who had patented a successful process in which he used petrolic ether as a solvent. Mr. Chiris bought the patent from Massignon, and after he had improved the process sufficiently to make its industrial application possible, he introduced the first natural perfume concrete on the market. He then built a large factory for the manufacture of these products, and from this time the business scope of the firm was considerably enlarged, and agencies were established on the old and new continents.



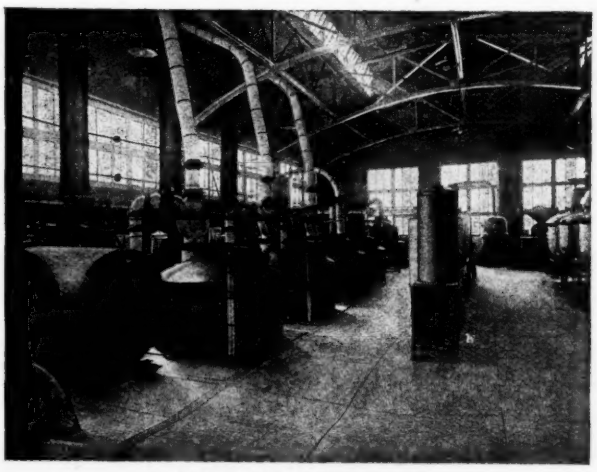
Research Laboratory

Leon Chiris sent his son, Georges, to New York in 1896, to establish an agency, which has subsequently become the Antoine Chiris Company. Mr. Georges Chiris's belief in America and her future possibilities started a desire to build and operate a factory here. He understood the importance of a complete essential oil distilling plant as well as a laboratory to produce aromatic chemical bodies, and he decided that his branch in the United States would be incomplete without both. In December, 1913, ground was broken here at Delawanna, and on November 10, 1914, work on a very limited scale was begun.

So far, there is nothing exceptional in this story; it is just an example of ordinary commercial development and enterprise. What interest it contains is due to the fact that a little over three months before the completion of the works the European War broke out. Up to that time the United States had been entirely dependent on Europe for a supply of synthetic aromatic chemicals, and the American soap and perfumery trades were soon confronted with depleted stocks and no source of further supply. In America the firm of

Antoine Chiris had been known as an importing firm, and, with their new works just established, they were appealed to to make an effort to supply the demand. Of course, they were assured of eternal support and gratitude, as British firms in corresponding circumstances were. Only supply the goods and American trade would be theirs for ever. There was only one thing to be done, and that was to organise the domestic manufacture of synthetics. From a small beginning in 1915, each succeeding year has witnessed a healthy growth, until at present the firm boasts of some sixty synthetic products, all manufactured in these new American works. Moreover, from past successes, an increase in the range of products is confidently anticipated, and the artificial production of such products as menthol, thymol, camphor, santalol, eucalyptol and cinanmyl alcohol is regarded as not impossible.

While the war lasted, and supplies could not be obtained from Europe, the firm were regarded as public benefactors, and the trades dependent on perfumes were duly grateful. But, following the Armistice and the gradual reopening of the old sources of supply, there came a change of attitude which supplies a moral and shows how much alike human nature is on both sides of the Atlantic. The moment it was found that cheaper products could be obtained abroad the consumer once again desired to buy in the cheapest market. Pledges were soon forgotten, and the promised protection was finally withdrawn. It was even suggested to the firm that, as an old importing house, they should resume importation and not bother about manufacture. Meanwhile, however, their plant had been erected, working experience had been gained, and success had been achieved in many directions. Moreover, as I was told, the production end of the business is found to be far more interesting than mere importation. It gives the chemist

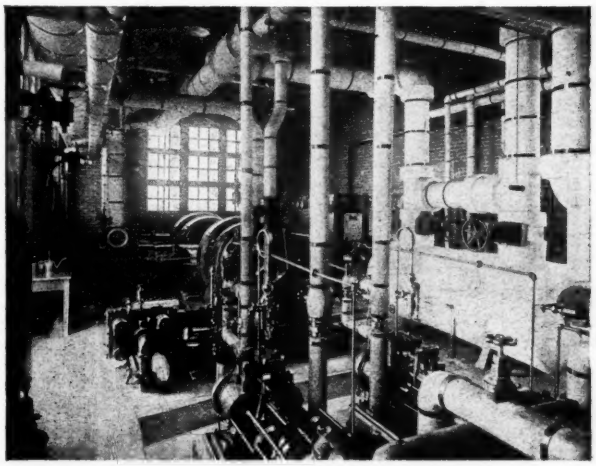


One of the Still Rooms

and the engineer their chance, it employs American labour, it pays American taxes, and it helps to make the country independent of foreign sources.

So the firm of Antoine Chiris are holding on to their new enterprise. The withdrawal of the embargo threatens their position, but it is not at all clear yet that it will prove a fatal blow; in fact, it was gratifying to hear that, in spite of the Government's action, trade is improving. The works are being continued because not only has the production of synthetics been successful but one thing done well leads to another, and chemical research is always opening out new possibilities. For example, during the past five years the firm has created a demand for products known as "capes viscose." These cellulose caps are found to be effectual sealers for bottles and other containers. Fitting over loosely, they gradually contract, adapting themselves to any shape, until they completely seal the receptacle. A great demand has arisen in America, and the firm are turning out very large quantities. The raw material is a good grade of paper pulp, and the process of manufacture from this stage up to the finished article is carried through in a plant adjoining the chemical works.

I have given an account of this works because it illustrates the position in which so many firms in America



Section of the Engine Room

find themselves through the change in public opinion and economic conditions. First, a national shortage of essential supplies and a resolve never to be dependent on foreign sources again; then a patriotic response from home manufacturers and popular praise of their enterprise; finally, as the old supplies are reopened, a waning of enthusiasm and a tendency to forget pledges. Here is a fully equipped manufacturing and research plant, producing articles not formerly produced in America and employing productive labour. Can anyone doubt, in the general interests of the country, that its continuance is for the good of America? And because the same question is equally applicable to hundreds of similar enterprises, both here and at home, this story may be well worth putting on record for the moral it conveys.

F. E. HAMER.

An Insurance Claim for Vanillin

IN the King's Bench Division on Tuesday, Mr. Justice Bailhache gave judgment for the plaintiffs in a case in which La Fabrique de Products Chemiques Société Anonyme claimed £825 from a Mr. Large in respect of a loss under a policy of marine insurance. It was stated that the plaintiffs carried on business in Switzerland. By a policy of marine insurance dated November 21, 1918, the defendant insured a parcel of goods consisting of one case of vanillin valued at £462, another case of vanillin valued at £363, and one case of kaffeine valued at £275, lost or not lost at and from London to Bordeaux while there and thence to Brougg in Switzerland against thieves. The agents of the plaintiffs in London handed the goods to the Lep Transport Co. for conveyance to Switzerland, and while they were in the warehouse of that company the two cases of vanillin were stolen on November 29, 1918. The plaintiffs now sued for £825, the insured value of the two stolen cases.

The defence put in consisted of formal denials, and a plea that the insurance was warranted free from particular average and the loss of the two cases constituted a particular average loss for which the defendants were not liable.

Mr. Justice Bailhache gave judgment as above, and allowed the plaintiffs interest from the date of the writ.

Safeguarding of Industries Act: Part I

Alleged Improper Inclusion of Oxalic Acid in Board of Trade List

A COMPLAINT that oxalic acid should be deleted from the list of articles chargeable with duty under Part I of the Safeguarding of Industries Act was heard by Mr. Cyril Atkinson, K.C., the Referee, on November 11. The complainants were the Chemical Merchants' and Users' National Vigilance Committee, represented by Mr. Kenneth Swan and Mr. R. L. Parry. The opponents were Messrs. J. D. Pritchard and Co., Ltd., chemical merchants, represented by Sir Arthur Colefax, K.C., and Mr. Stafford Cripps, and the Board of Trade was represented by Mr. Whitehead. There were other interests concerned with the opposition, and these were left in the hands of Mr. Whitehead.

The Complainants' Case

Mr. KENNETH SWAN, for the complainants, said oxalic acid, $C_2H_2O_4$, took its name from *oxalis acetosella*, wood-sorrel, in which it was found. It occurred in various plants and herbs, but it was not practically obtained from any of these sources. It had been in common use for a considerable time, and the earliest means of obtaining it was by the oxidation of starch or sugar or similar substances by nitric acid. That process was superseded by the sawdust process. Pine sawdust was mixed with caustic alkalis—caustic potash and caustic soda chiefly—and was subjected to heat, and the mass blackened and decomposition took place, oxalic acid being formed in the mass, and subsequently extracted. That process was still carried out; he believed the manufacture of oxalic acid in this country was carried out in this way. The extraction of the oxalic acid from the mass of alkali and sawdust was carried out in various ways, one of which was to treat the mass with milk of lime, which produced calcium oxalate, and subsequently to displace the calcium by sulphuric acid by means of chemical recoveries. The world production of oxalic acid ran into thousands of tons, and the figure for importation into this country before the war was 1,400 tons per annum. It did not appear in the British Pharmacopœia as a pharmaceutical product. The normal degree of purity of the commercial commodity was about 98 per cent., although before the war it was between 98 and 99 per cent. The entry in the list of articles chargeable with duty was simply "Acid Oxalic," but there was no letter "R" against it. The Board of Trade, in their counter-statement, said they had included it because it was not only a fine chemical but a synthetic organic chemical and an analytical reagent. The real issue in this case was whether or not oxalic acid was a fine or a heavy chemical.

In reply to a question by the Referee, Sir Arthur Colefax said he relied on the fact that oxalic acid was a synthetic organic chemical. Relatively, he did not think he would press the point that it was a fine chemical so strongly, but it was a point, and further, the Referee would have to consider the fact that it was an analytical reagent.

Trade Usage and Custom

Mr. SWAN, in reply to the Referee, said he agreed that the substance was organic. Indicating the lines of his argument, he said he would lay very strong stress on the fact that it was undoubtedly a heavy chemical. He had a mass of evidence to show that oxalic acid had, beyond question, by trade usage and custom, always been regarded as a heavy chemical. If he did not prove that it was a heavy chemical his case would go. If it were a heavy chemical, he was entitled to succeed. He had always said that the series of categories under the Schedule to the Act, namely, "(a) synthetic organic chemicals, (b) analytical reagents, and (c) all other fine chemicals," were descriptive of fine chemicals and nothing else. He agreed that that point had not been decided, but there had been no decision which was in the least inconsistent with that interpretation. If he could prove that a substance was a heavy chemical, then it was neither (a), (b) nor (c).

Dealing with the Board of Trade's contention that oxalic acid was a synthetic-organic chemical, he said he would meet that in two ways. He would prove that it had never been treated in the trade as a synthetic organic chemical, and he would deal with the matter from the point of view of scientific evidence as to what was understood to be a synthetic organic chemical. He hoped to satisfy the Referee that oxalic acid, even if produced in the manner specified by the Board of Trade, i.e., by the decomposition of formates, was not a synthetic body.

The REFEREE said he did not think he was prepared to hear evidence as to what "synthetic" meant. Sir Arthur Colefax and Mr. Swan then agreed to adopt the definition given in the camphor case.

The Formate Process

In framing their case, that oxalic acid was a synthetic organic chemical, continued Mr. Swan, the Board of Trade had said that one of the methods of manufacturing oxalic acid was to pass carbon monoxide gas through fused caustic soda, which resulted in the formation of formate of soda, NaCOOH. The Board of Trade said that by causing a molecule consisting of CO to unite with a molecule of caustic soda, NaOH, that was a synthesis within the meaning which the Referee had applied, he submitted rightly, to the term synthetic organic chemical. The next step in the formate process was to decompose that formate by subjecting it to heat and pressure in a furnace. This drove off the hydrogen, and the resultant product was oxalate of soda, $C_2O_4Na_2$. Having obtained that oxalate of soda they displaced the soda by treating the product with sulphuric acid, and so obtained oxalic acid. The last ground for objection was that the Board of Trade had treated oxalic acid as an analytical reagent.

Mr. A. F. BUTLER (a director of R. W. Greeff and Co., Ltd.), chemical merchants, said he had had an extensive experience of trading in oxalic acid, and the business of his firm in this body amounted to hundreds of tons a year. He bought from abroad mostly, but also bought the home product from time to time. He had been told that the oxalic acid produced in this country was made by the sawdust process. It was undoubtedly treated as a heavy chemical by the trade, and he had never heard it classed as a fine chemical. Catalogues prepared by Messrs. Greeff were then produced, one published pre-war and one in January, 1922, in which oxalic acid was listed amongst the technical chemicals. There was also a list of fine chemicals and pharmaceutical products published by the firm, in which oxalic acid was included. This was a list which was circulated amongst pharmacists, but oxalic acid was a heavy chemical which was sold to them, and for that reason it was included. Pharmacists sold oxalic acid in small quantities for cleaning hats, etc., but witness had not, to his knowledge, sold it for pharmaceutical purposes. With regard to purity, before the war this was 99 to 100 per cent., but that was not maintained now, the purity being between 98 and 100 per cent. As to the use of the term synthetic organic chemical in the trade he had heard it used, and believed he had seen it in the advertisements of British Drug Houses, Ltd. He personally had associated "synthetic" with fine chemicals principally, and in his trade experience he had never heard oxalic acid described as a synthetic organic chemical.

The REFEREE said he took it that it had never occurred to the witness, or anybody else, so far as he knew, to regard oxalic acid as synthetic.

Mr. BUTLER said that was the point. Replying to further questions by Mr. Swan, he said he had never heard oxalic acid classed as an analytical reagent.

Sir ARTHUR COLEFAX said that before the war some of the large manufacturers of oxalic acid in Germany formed themselves into a combine, and Messrs. Greeff were their agents.

Mr. BUTLER would not use the term "combine" but referred to it as an association. Messrs. Greeff were not agents of the firms concerned, but of the Verkaufsstelle für Oxalsaure, the selling office of the Association. He did not know whether the sodium formate made in Germany was made by the synthetic process. Answering further questions, Mr. Butler said that the output of the selling office of the Association represented a very large percentage of what was produced in Germany, and that before the war Germany was by far the most important exporting country for this product. He agreed that Messrs. J. D. Pritchard and Co., produced oxalic

acid, by the sawdust process. He did not know whether or not there were any competing exporters to this country before the war. It could be obtained from Norway, but he was not sure when the competition started, although it might have been before the war. He was not sure what the Norwegian process was. The oxalic acid which his firm handled in 1920 came from Holland principally, and was made by the formate process. There was a little coming from Germany, but he did not think his firm handled any.

Sir ARTHUR COLEFAX stated that Messrs. Pritchard had closed down their works. With regard to the catalogue, he pointed out that although oxalic acid was mentioned amongst technical chemicals, he had not seen the term "heavy chemicals" at all. With regard to purity, he said that the guarantee at present was 98 per cent., but, generally, the purity ran to just over 99 per cent.

Mr. BUTLER said it did not always reach 99 per cent. to-day. Replying to the Referee, he said he had always had the impression that the English product was not so pure as the German.

Sir ARTHUR COLEFAX said that, generally speaking, the sawdust product was not so pure as the formate product; the latter was the whiter.

Mr. WHITEHEAD, cross-examining, referred to the association of "synthetic organic chemical" with fine chemicals, and asked the witness whether, if it were demonstrated that oxalic acid was a synthetic organic chemical, he would regard it as a fine chemical?

Mr. BUTLER said he would not, but if what Mr. Whitehead had said were demonstrated he would agree that there were synthetic organic chemicals which were not fine chemicals. He admitted that a special brand could be regarded as an analytical chemical, and possibly as a fine chemical.

Mr. W. G. WILSON (a director of Charles Page and Co., Ltd., chemical merchants) said he treated oxalic acid as a heavy chemical. His firm purchased from Messrs. Pritchard, from Germany, and a small quantity from America, and were agents for the Victor Chemical Works, Chicago, who turned out over 1,000 tons of oxalic acid per annum. He believed that firm used the formate process, although the sawdust process was used in America. Messrs. Page sold oxalic acid to the textile industry, the tanning and straw-bleaching industries, as well as to wholesale chemists. They did not accept orders for less than a cask, and they sold quite a large quantity in 10-ton lots. He did not know of any firms which were buying refined oxalic acid in this country, but he assumed that some firms re-crystallised it in order to get a finer product for the chemists' trade. He had not heard of it being imported in the re-crystallised form.

Cross-examined by Mr. Whitehead, Mr. Wilson said his firm had two departments, one of which was a heavy chemical department. He would not agree that oxalic acid was treated in the heavy chemical department simply because larger quantities were sold; it was regarded as a heavy chemical.

Mr. JOHN BROWN (Messrs. Brown and Forth, chemical merchants) gave similar evidence as to trade usage. He always assumed that a fine chemical was a B.P. product; he had never seen oxalic acid described as a B.P. product, and had never heard of its use for pharmaceutical purposes. From his own experience he would regard oxalic acid as a heavy chemical, and he believed the trade considereditto be a heavy chemical. He had not heard it described as a synthetic organic chemical.

Reactions in Formate Process

Mr. E. J. PARRY (consulting chemist) said that neither the formate nor the sawdust process of manufacture were synthetic processes. He had invariably found oxalic acid referred to in literature as a heavy chemical. He produced a number of catalogues in which it was included amongst typically heavy chemicals. In the issue of THE CHEMICAL AGE for March 5, 1921, it appeared under the heading of "general chemicals," all of which were heavy chemicals, and in the issue for October 28, 1922, in the Scottish chemical market report, it appeared under "industrial chemicals."

With regard to the term "synthetic organic chemical," generally speaking, the trade associated synthetic chemicals with bodies such as aspirin, salicylic acid, etc. The oxalic acid imported into this country was produced by the process described in the Board of Trade counter statement, but the practical details were meagre and incorrect. With regard to the two reactions, from caustic to formate and formate to oxalate, he pointed out that they only got a yield of from 45 to 75 per cent. of the respective reaction products, because subsidiary reactions besides those stated by the Board of Trade were taking place at the same time. It was not correct to say that small quantities of activating agents were used. The mechanism of reaction as set out by the Board was merely speculative, and was not known. The process was a two-step process, and did not correspond with the definition of a synthesis as set out in the Referee's decision on the synthetic camphor case, which was "A building up of carbon compounds either from their constituent elements or from groups of differently-constituted molecules by orderly steps, the result of which can be followed, and from which the constitution of the structure can be deduced or inferred." For instance, the introduction of carbon monoxide into the caustic soda was not a step which involved the building up of carbon compounds from their constituent elements. There were no organic radicles involved, and there was no increase in the number of carbon atoms; one carbon atom was involved in the reaction and one in the finished product. In the counter statement it was said that the number of carbon atoms in the molecule was progressively increased, but the word "progressively" should not be there. There was no increase of the carbon constituent. The reaction was a haphazard high-temperature reaction, which would not allow them to deduce anything from it until experimentally demonstrated. With regard to the next step, the heating of the formate of soda under pressure, that lacked practically every characteristic of a synthetic reaction.

Meaning of "Synthesis"

Replying to the Referee, Mr. Parry said that if the word "synthesis" were given a very broad meaning, he believed it would mean that a whole pile of heavy chemicals would have to be included as synthetic products. With regard to the use of oxalic acid for analysis, Mr. Parry said that in practice it had become very discredited in this connection, and most text books on analytical reagents spoke of it in a more or less disparaging way. He had not used it for 10 years, and if he did use it he would prepare it himself. When used as a reagent it was specially crystallised, and it could be bought from eminent firms, such as British Drug Houses, Ltd., in various grades of purity at very much higher prices. It must not be less pure than 99.8 per cent., and there must be no variation.

Sir ARTHUR COLEFAX said it had not been suggested that oxalic acid was used as an analytical reagent except when it had a high state of purity, and there was no dispute about that. Mr. Swan pointed out, however, that there was no "R" against it in the list.

Sir Arthur put a number of questions in which he sought the admission from Mr. Parry that the formate process was almost universally spoken of in text books as a synthesis, but witness would not agree, nor that the writers generally regarded it as such. Replying to the Referee with regard to the definition of a synthesis, Mr. Parry said he preferred to use the words given by Dr. M. O. Forster in the camphor case, when he said that the reaction must be controlled all the way to constitute a synthesis. In reply to Sir Arthur Colefax, he agreed that all substances formed by direct combination of their elements were commonly spoken of as syntheses. It was agreed by Mr. Parry that one set of chemists thought that the sodium oxalate resulted from the simple union of two residues of like character, with the elimination of hydrogen, (that was what he was putting before the Referee), whilst another set thought that they got carbon linked to carbon, not by the mere union of two residues but by an intermediate decomposition resulting in the formation of carbonate of soda and carbon monoxide, with also the elimination of hydrogen.

Mr. WHITEHEAD asked Mr. Parry if he would not accept it as being at all events the general view of chemists that the preparation of oxalic acid by the formate process was a synthetic operation? Mr. Parry said that if Counsel meant the wider use of the word "synthetic" that was undoubtedly so. Mr. Whitehead, therefore, said he took it that Mr. Parry agreed with statements in a number of books that it was a synthetic operation, but that they must watch the use of the word "synthetic."

The hearing was then adjourned until Thursday, but as we go to press the result is not known.

De-Watering of Peat by Pressure

Professor Hinchley on a Commercial Process

THE Chemical Engineering Group of the Society of Chemical Industry held a meeting at the Chemical Industry Club on November 10—Mr. J. A. Reavell, chairman of the Group, in the chair—when Professor J. W. Hinchley read a paper on "The Dewatering of Peat by Pressure." At the close of the discussion, the chairman said it was hoped to make these "homely" meetings a regular feature, and he hoped that the success of the present one, and the large attendance, would be repeated at the later meetings.

Composition of Peat

In the course of his paper Professor Hinchley said that peaty matter contained on an average, when free from moisture, about 60 per cent. of carbon, the remainder being mainly hydrogen and oxygen, and according to the conditions under which the deposit was formed, associated ash might vary from .5 to 20 or 30 per cent. It was obvious that peat would contain such chemical substances (or their decomposition products) which characterised the plants from which it was produced, and it was found that while some peats contained 6 or 10 per cent. of waxes, resins, etc., others might contain less than 1 per cent. of these substances. As a general rule peat contained less sulphur than the plants from which it was derived, and it was interesting to note that this elimination of sulphur might often be observed in peat bogs.

Freedom from Sulphur

On account of its freedom from sulphur, and also from smoke, and its well-divided condition, dry peat burned with far higher efficiency in furnaces than coal. Owing to the comparative absence of sulphur, peat carbon was a valuable material in industry, and it was possible to obtain an almost chemically pure carbon by the carnonisation of peat. Its finally-divided condition made it most convenient also for the manufacture of decolorising and activated carbons. Raw peat in fairly-drained bogs was usually associated with from 85 to 90 per cent. water. The peat also contained a quantity of colloidal material which was useful in some processes for the utilisation of peat, whilst in other processes steps were taken to destroy it, so that the elimination of water might take place more rapidly. The shrinkage of air-dried peat as cut from the bog, on account of the presence of this colloidal material, was generally about 70 per cent.

Dealing with the mechanical handling of peat by pressing processes after it has been obtained from the bog, the lecturer said that up to the present, the only methods of utilising peat which have persisted have depended upon air-drying. The efficiency of methods of obtaining peat by air-drying was limited by the climate, and in few cases could more than two "crops" per year be obtained. Of the processes for the rapid drying of peat, a direct drying operation could not be a commercial success. Recently, the problem of drying by direct heat had been resuscitated through the development of the "heat pump evaporator." Heat pump evaporators were now made which could be depended upon to evaporate at a rate such that one kilo. of steam would evaporate 4 kilos. of water. Whether this process could be applied to such a material as peat was extremely doubtful.

A Satisfactory Method

The author said he had been experimenting for a good many years on methods of de-watering peat by pressure, and was convinced that such methods offered an attractive commercial solution of the problem. In drying peat by heat or by air-drying processes, the presence of the colloidal matter might be a distinct advantage, but in getting rid of the water by pressure, the presence of this colloidal material was a most serious objection, and methods had to be adopted by which the colloidal matter was completely or largely destroyed. Both extreme cold and heat were capable of bringing about this result, and the problem of getting rid of the water was reduced to devising a mechanical process which should not only be practical but which would pay.

It had been stated that the percentage of water in peat as it occurred in a drained bog was usually from 85 to 90 per cent. By a simple pressing operation in the cold, which could be carried out by means of a "squeezing-conveyor" at the bog itself, this percentage of water could be reduced to from 80 or 81 per cent. A pressure of 50 lb. per sq. in. was necessary, and the time of application would depend on the thickness of the layer.

Practical experiment by the author had shown that in suitable apparatus it was not necessary entirely to destroy the colloidal matter present in the peat successfully to remove the water by pressure down to approximately 50 per cent. He had found that temperatures approaching the boiling point of water were sufficient.

Experiments in Pressing

The work of the author had been carried out in a press, which, from a practical point of view, was extremely effective and efficient. Experiments on a small press showed that after warming to the boiling point of water, suitably applied pressure rising slowly to half a ton per sq. in. reduced the water-content of Norfolk peat below 50 per cent. In some of the experiments with certain Norfolk peats a figure of 35 per cent. was obtained, but generally the figure was 42 to 45 per cent.

With regard to the cold pressing of peat, it was desirable to know to what extent cold pressing could be applied, and a curve obtained in experiments on Somerset peat was shown, from which it was seen that at a pressure of nearly 800 lb. per sq. in. and pressing under the best conditions, the percentage of water was only reduced to an average of about 75 per cent.

The peat used on that occasion did not part with any water until a pressure of 150 lb. per sq.in. had been reached. On examination of the press after the cold pressing was concluded, it was found that the filtering surface was completely choked and that a considerable amount of cleaning was necessary.

Cost of Plant

After giving a detailed account of the pressing operation, Professor Hinchley said a small press had been worked for six weeks continuously without any difficulty with the filtering surfaces and with practically no variation in its performance. It was designed as a portion of a commercial press of six chambers to take a charge of 1½ tons per operation. Such a press with accessories would cost about £2,000, and would treat about 60 tons of 80 per cent. peat per day of 24 hours, yielding 30 tons of peat cake and about 20 tons of dried peat per day, of which 5 tons would be burned in the power plant, giving a net yield of 15 tons per day.

Discussion

Dr. R. LESSING said that from the nature of peat it was not likely that they would be dealing with water at all but with a solution of salts and also of organic matter, particularly colloidal matter, and it seemed to him that the nature of that solution must have a very great bearing on the possibility of freeing the peat from water.

Mr. P. PARRISH said that in connection with the sale of bog ores and oxides of iron, the practice had been adopted that all expressions should be based on the dry basis in order that a true indication might be arrived at as to the moisture content. Referring to some peat deposits about 40 miles from Melbourne, where there were something like 23 million tons of peat of a most peculiar structure and origin, Mr. Parrish said it existed quite adjacent to the sea and might be described as a vegetable peat which was a kind of guano; when dried and distilled it gave from 18,000 to 19,000 B.Th.U. per ton and a low grade gas of 250 B.Th.U. per c. ft., and about 100 to 120 lb. of sulphate of ammonia per ton, and yet it was impossible to work this material on an economical basis simply by reason of the peculiar structure and the way in which water appeared to be occluded in certain colloidal matter. Humic acid occurred, and it was a matter to which attention should be directed. Could Professor Hinchley say anything with regard to the de-watering of the top layers of peat which was interesting a good many people in this country?

Mr. COLIN SUTTON asked if the process described in the paper could be used for dealing with sewage sludge.

Mr. RADCLIFFE, secretary of the Manchester Section of the Society of Chemical Industry, said he had some experience with Irish peat from the North of Ireland and the experience

there was that the humic acid content of peat differed according to the depth to which the peat was worked. It was also found that the liquid from the peat varied according to the depth. Further, there was also a very considerable difference in the preservative properties of peat according to the depth from which it was taken; Irish peat possessed most extraordinary preservative properties.

Mr. A. J. BROUGHALL asked if the principle of vacuum drying had been applied to this problem, because it seemed to offer great possibilities. He wondered if the question of air bubbles had been considered, because it seemed to him that in peat a great deal of air must be locked up, and the existence of these air bubbles on the edge of the cake might retard the flow of water from inside.

Disinfecting Qualities

Dr. REILLY, speaking with regard to the disinfecting nature of the material from peat, said that before the war at the Portadown works for the production of producer gas from peat, Professor Morgan obtained a large number of peat tars which contained phenolic bodies which were quite different from what was obtained from coal. Work on these was not continued, and he did not know whether these disinfecting bodies were in the original peat.

THE CHAIRMAN said he had hoped that some questions would have been asked about the heat pump. As to the actual pressing, he understood that it was very difficult to get equal pressure all over the surface of the cake, particularly a cake of the size dealt with in this case, and he would like to know if any careful investigations have been made to find out the percentages of moisture as they were distributed throughout the cake, because he should imagine that there would be portions relatively dry and other portions containing a considerable amount of moisture. A press had recently been invented by one named Humphrey—he believed a brother of the inventor of the Humphrey pump—which gave equal pressure all over, and it was entirely different from any press he had seen. Some remarkable results had been shown to him with this press, and the great claim for the press was that it gave absolutely equal pressure all over the cake.

Professor Hinchley's Reply

Professor HINCHLEY, replying to the discussion, said that there must always be portions, when dealing with peat, which would have more moisture than others. Flow of liquid in the cake could only take place if there was more liquid at one point than another. There was greater pressure at one point due to the presence of fluid and the centre of the cake would contain more fluid than the exterior. The point of the whole thing was that the rate of pressure should not be so great as to diminish the resistance to flow of the outer layers of the cake too rapidly by pressing the outer layers so that the resistance to flow was increased and in that way seal the outer layers. The question of securing a uniform pressure all over the cake was a matter well worth consideration; on the other hand, it was one of those minor points which did not affect the work very seriously. He worked with a pressure of from 400 to 800 lb. per square inch, and the variation in pressure from the top to the bottom of the cake was in the neighbourhood of 50 lb. All the chambers of the press were filled to begin with, so that variations in pressure must occur. If they tried to make any process on a commercial scale perfect, then no process would ever be worked.

The most economical way of working in the present case was to work at a pressure of 500 lb. per square inch. The press mentioned by the chairman worked with toggle joints, and these were not easy to get to work and give the same results every time continuously. The difficulties with such a press were far greater than the difficulties introduced by the ordinary hydraulic press, which was capable of working at a high efficiency. The hydraulic presses now in operation on this work had been in operation for three years and the differences in the results were not very serious. In the oil cake mills they used hot pressing, and although it was easy to use this with peat it was not so easy to use it and get commercial results. A charge of £2 10s. per ton could be made for pressing in the case of oil seeds, but in the case of peat they could not have bags or hand labour. It was necessary to have a receptacle into which the material could be dropped, and it was also necessary to have much larger loads than in an ordinary oil press.

As to peat tars these would, he was convinced, become a big commercial proposition in a few years, and in that case we should have a new chemistry, and a large number of bodies from which would be obtained phenols and similar bodies which would be of tremendous use. In the case of producer gas, if the peat contained more than 60 per cent. of moisture, the proposition was not a good one; that was the general view, but he believed that it would pay the people at Portadown to dry their peat more than they did, because the drier the peat the more valuable it was for producer gas.

As to waxes, Doncaster peat yielded 7 to 8 per cent. of waxes and resins, but some peats had practically none at all. He was not particularly enamoured of vacuum drying, and from the results he had seen he had come to the conclusion that vacuum drying was not quite the wonderful thing that it might appear. As the the depth of the peat, mentioned by Mr. Radcliffe, the last layer of peat was a slurry and it cost more to briquette it; therefore, it was better to leave it. Another reason for not taking out the lowest layer was that by doing so the ground was not so readily available again for agricultural purposes. Most of the experiments were done with peat 3 ft. to 6 ft. or 8 ft. down. As to sewage sludge, he had not gone into that, but it appeared to be much the same as the lower layers of peat to which he had referred. With regard to the terminology in the paper, he did not apologise for the terms he used. He preferred calories to B.Th.U.'s because he believed it was a much more scientific term and told the story without any reservations like the therm. The peat mentioned by Mr. Parrish did not come within the scope of the investigations he had been doing and would not work at all. There had been a great number of processes tried for using centrifuges for peat, but they had invariably been failures. The "Gee" centrifuge was about the only one that was successful, but when they considered the putting through of several hundred tons of peat in a centrifuge they would realise the size of the plant required and the capital involved. He did not think the solution of the peat problem lay with the centrifuge. As to working in two stages, as mentioned by Mr. Parrish, the process described in the paper actually worked in three stages. As to the nature of the filter surface, it was a metallic perforation. The actual loss of peat in the water given off was negligible, but there was a great deal of work necessary in the investigation of the constitution of peat, and for that reason it was best to commence the work on a small scale before dealing with it on the large commercial scale.

Institute of Chemistry

Regulations for Admission of Fellows and Associates

THE Council of the Institute of Chemistry have decided that after January 1, 1923, candidates who are elected to the Fellowship without passing through the grade of Associateship, or to the Associateship, shall be required, as a condition precedent to their admission to the Institute, to attend before the council or before the committee of a local section, to make the declaration required by the by-laws, and to receive their certificates from the President, or the Chairman of the local section as the case may be. The ceremony will take place at the council meeting or local section meeting next succeeding the meeting at which the new member has been elected.

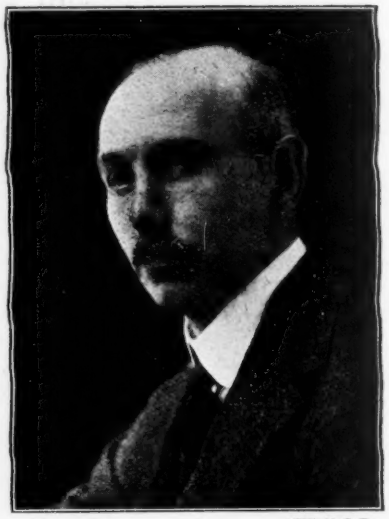
The Council have also decided, subject to the concurrence of the honorary corresponding secretaries, that in the case of a newly-elected Fellow or Associate resident in the Dominions or elsewhere abroad, where an honorary corresponding secretary has been appointed by the Institute, the new member shall be required, at a convenient time, to hand his declaration to the honorary corresponding secretary, from whom he will receive his certificate of membership. Where there is no honorary corresponding secretary the Council may dispense with this requirement, but will welcome the new member when he is in this country.

The Council hope by this means to bring the new Fellows and Associates immediately into direct touch with the Institute and its Sections, and encourage them to take an active interest in the work of the Institute for the good of the profession.

[Elliott & Fry

Professor F. Soddy, F.R.S.
(Nobel Chemistry Prize, 1921)

Mr. Max Muspratt
(Baronetcy)



[Elliott & Fry

Dr. F. W. Aston, F.R.S.
(Nobel Chemistry Prize 1922)

Honours for Well-known Chemical Leaders

Nobel Chemistry Prizes

Two Notable Honours for British Scientists

THE Nobel Chemistry Prizes for 1921 and 1922 have both been awarded to British scientists. Professor Frederick Soddy, F.R.S., of Oxford, whose name is particularly associated with the study of radio-activity, is the recipient of the prize for 1921, while Dr. F. W. Aston, F.R.S., Research Fellow of Trinity College, Cambridge, has been awarded the 1922 prize.

Born at Eastbourne in 1877, Professor Soddy was educated at Eastbourne College, the University College of Wales, and at Merton, Oxford. Proceeding to Canada he was appointed Demonstrator in Chemistry at McGill University, Montreal, a position which he held from 1900 to 1902. From 1901 to 1903 he received training in scientific investigation under Sir Ernest Rutherford, after which he returned to this country and spent a year under Sir William Ramsay. Professor Soddy was appointed Lecturer in Physical Chemistry and Radioactivity at the University of Glasgow in 1904, a post which he retained until 1914 when he left to take up the Professorship of Chemistry at Aberdeen University. In 1919 he was appointed Lee's Professor of Inorganic and Physical Chemistry at Oxford. Among his other distinctions, Professor Soddy has been president of the Röntgen Society, and was the recipient of the Cannizzaro Prize (Rome) in 1913. He was made a foreign member of the Swedish Academy of Sciences in 1919.

Professor Soddy is the author of numerous scientific publications, chiefly on radioactivity, some of his best-known works being *The Interpretation of Radium*, *Chemistry of the Radio-Elements*, and *Science and Life*. Of a different character is his pamphlet on *Cartesian Economics*, which was reviewed recently in THE CHEMICAL AGE.

He was married, in 1908, to the daughter of Sir George Beilby, F.R.S.

Dr. F. W. Aston

Dr. Francis William Aston's award was in recognition, among other things, of his discovery of a great number of non-radioactive elements. Dr. Aston was born at B rmingham on September 1, 1877—curiously enough a day before Professor Soddy—and is the second son of Mr. William Aston. He was educated at Malvern College, the Mason College (Forster Research Scholar), Birmingham University (University Research Scholar), and Cambridge University. Appointed Assistant Lecturer in Physics at Birmingham University in 1909, he entered Trinity College, Cambridge, the following year, and studied under Sir J. J. Thomson and Sir Ernest Rutherford at the Cavendish Laboratory. Dr. Aston is a D.Sc. of Birmingham University, M.A. of Cambridge, and is an Associate of the Institute of Chemistry. He was awarded the Mackenzie Davidson Medal of the Röntgen Society in 1920, was elected a Fellow of the Royal Society last year, and has been secretary of the Cambridge Philosophical Society since 1920.

His publications include numerous papers in scientific periodicals on electric discharge in gases, mass spectra, isotopes, and other physical and chemical subjects.

Dissolution Honours

A Baronetcy for the United Alkali Co.'s Chairman

In addition to the recognition shown to the purely scientific side of chemistry by the two Nobel Prize awards, the Dissolution Honours List includes the names of two prominent figures in British chemical industry, Lord Leverhulme, chairman of Lever Brothers, Ltd., and associated companies is made a viscount in recognition of public services, and Mr. Max Muspratt, chairman of the United Alkali Co., Ltd., becomes a baronet, the honour being an acknowledgment of his service during the war in the Trench Warfare Department.

Born in 1872, he completed his education at Zurich, where he was the first Englishman to take the Swiss Government diploma in industrial chemistry. In 1895 he entered the works of the United Alkali Co., Ltd., and ultimately succeeded Mr. John Brock as chairman. One of the most important parts of his war work was his organisation and supervision, under the Ministry of Munitions, of the manufacture and distribution of sulphuric acid.

In addition to serving on the boards of other industrial concerns, he is chairman of the Association of British Chemical Manufacturers and a vice-president of the National Sulphuric Acid Association and of the Federation of British Industries.

History of Rosin Chemistry

Constitution of the Abietic Acids

AT a meeting of the Oil and Colour Chemists' Association held on November 9, the President, Dr. C. N. Friend, in the chair, Mr. Charles F. Soane, F.I.C., read a paper on "The Chemistry of Rosin and Rosin Oils."

The author stated that a perusal of the text books dealing with rosin and rosin oils revealed an extraordinary lack of consistency; in fact, he had not seen one book that did not contain statements at variance with recent research. In these circumstances it might serve a useful purpose briefly to survey the history of rosin chemistry. After paying a compliment to Mr. T. H. Barry, for assistance in the preparation of the paper, Mr. Soane said that colophony, known commercially as rosin, was to be understood to mean that residuum after the expulsion of oil of turpentine from the resinuous exudation of coniferous trees. It was imported in large quantities, chiefly from the United States, France and Spain, and since 1916 the importation had been from 40,000 tons to over 100,000 tons per annum. American rosin, which formed the bulk of our supplies, was said to be derived mainly from the long leaf pine, *Pinus Australis*, and French rosin from *Pinus maritima*; the composition of the two being somewhat different. This commodity had been the subject of innumerable chemical investigations, commencing at the beginning of last century and continued right down to the present day, but even now there were many problems that still awaited solution. Giving a more or less chronological summary of the literature, the author said it was left to Tschirch in 1903 to determine that from American colophony were obtained three abietic acids—alpha, beta and gamma, but Tschirch's method was a very laborious one, and Seidel's process avoided Tschirch's lengthy extractions and shortened the process by precipitation with lead acetate, although a preliminary purification of the colophony was found to be necessary in order to get rid of traces of terpenes that remained in the commercial article, these terpenes having an extraordinarily powerful retarding effect on the precipitation of the lead salts; quite a small amount being sufficient entirely to prevent precipitation. Even with Seidel's method the three acids, as isolated, were unstable, and it was only after distillation more than once repeated, in the vacuum of the green cathode light, that preparations could be obtained that would distil unchanged, without residue, and which could be preserved without decomposition when kept in sealed tubes.

Melting Point Determination

Dealing with the properties of the three abietic acids, the paper pointed out that melting point determination, so much relied upon in the identification of individual chemical substances, appeared to be an uncertain guide in the case of the abietic acids. The melting points were by no means fixed, and they appeared to depend partly upon the past history of the sample. A better criterion, although not a convenient one, was boiling point. In an absolute vacuum (green cathode light) the alpha acid under these conditions boiled at 192°, the beta acid at 163°, and the gamma acid at 172°. The beta and gamma acids could be distilled again and again without change of boiling point, but the alpha acid which distilled at first at 192°, exhibited a falling boiling point until 162° was reached.

Amorphous Colloidal State

Many observations made upon colophony and the rosin acids from it, proved, said the author, that we had to do with substances that are, under most circumstances, in the amorphous colloidal state. It was contended that observations upon crystallisation demolished the theory, that the acids in ordinary colophony are the anhydrides, and that crystalline acids are hydrates. This motion arose from the fact that crystalline acids had been prepared from aqueous alcohol. It was now known that the amorphous might be changed to the crystalline form, in the complete absence of water, by the action of heat alone. The author added that a formula $C_{20}H_{30}O_2$ might now, with practical certainty, be said to represent the abietic acids, notwithstanding assertions to the contrary.

Dealing with pimaric acid, the lecturer said this product deserved special mention, partly because considerable quantities of French rosin were now being imported and partly because the acid seemed to have more distinguishing features than most others. It existed in both laevo and dextro form and both gave crystalline ammonium salts, whereas those of the abietic acid were gelatinous. The pimaric acids seemed to have greater stability than the abietic acids of American colophony. The origin of resins and the relationship of the abietic acids to those of other coniferous resins were problems not yet satisfactorily solved. The general view as to origin was that resins were oxidation products of the terpenes, with which they were associated in the natural terpenes, and this seemed a reasonable assumption.

The constitution of the abietic acids was next dealt with, and this, said the author, was best attacked by a consideration of the products of decomposition of rosin, which brought us in touch at once with rosin oil, which might be regarded as the chief product of the distillation of rosin at high temperature. From a consideration of researches by various investigators, the author said it followed that rosin oil consisted essentially of a mixture of hydrocarbons of the hydrogenised retene type, together with such decomposition products—approaching a benzenoid character—as resulted from a kind of cracking process as the higher temperatures of distillation were reached. After a plea for expressing the results of examinations of rosin as percentages of resin acid instead of giving the so-called acid value, Mr. Soane said it was often stated that the resin acid in rosin oil was due to rosin being carried over mechanically during the distillation but this he held to be erroneous, except, perhaps, in exceptional cases. The resin acid distilled over in the vapour of rosin oil just as terpenes would distil over in the vapour of ether.

A discussion followed, in which Dr. R. S. Morrell, Dr. H. H. Morgan, and Mr. T. Hedley Barry took part, and to which Mr. Soane replied.

Protecting German Chemical Industry

Dr. Duisberg on Reparation Dyestuffs

AN interesting statement in the form of a presidential address, delivered by Dr. C. Duisberg at the annual meeting of the Union for the Protection of the Interests of German Chemical Industry, quoted by a *Times* correspondent, contains a bitter complaint on the effect of the clause in the Versailles Treaty by which 25 per cent. of the output of dyestuffs and fine chemicals have to be given up at the German price. He boasts that, in spite of protective tariffs and licence systems directed against the German products, and in spite of direct State aid, the recently established industries of that nature in the Allied countries are all losing money, even over the small number of the German products that they have succeeded in making. Much damage is done to the German industry, however, in neutral countries. According to Dr. Duisberg, Reparation dyes and chemicals are being sold, chiefly by Italy, in South America and the Far East, at prices lower than at home.

But, in spite of these handicaps, the German chemical industry is prospering. It differs from most industries in that most of the raw materials have not to be imported. Soda has to be obtained from Alsace-Lorraine and Switzerland, and, because of the price of benzol, it is now cheaper to buy carbolic acid from Great Britain than to make it synthetically. Because of the surplus of exports over imports, dyes and chemicals stood third in the list of German industries in April and June of this year and second in May and July. According to the figures he gives, the export of chemicals and dyestuffs, reckoned in paper marks, rose by 170 per cent. in the first half-year of 1922 as compared wih the corresponding period in 1921. In the first three months of 1922 there was no surplus of exports over imports; between April and July the surplus rose from 1,712 to 3,409 million marks.

Dr. Duisberg also stated that "although the Allied Commission has destroyed the poison-gas manufactories of Germany, those of France, England and America are in full swing. A scheme of M. Poincaré to take 60 per cent. of the capital of German chemical industries was only foiled by Mr. Lloyd George, who foresaw that the result would be to place England at the mercy of France. But Mr. Lloyd George's intervention was unnecessary; the German chemical industry, whoever owned the capital, would produce little unless it were manned by the super-brains of Germany. Even chemical industrials are not machines; they are creatures of love and of hate, and would never work for the foreigner. Never, never!"

October Trade Returns

£140,000 Decrease in Chemical Exports

ACCORDING to the Board of Trade Returns for October, our exports of chemicals, drugs, dyes and colours, valued at £1,590,287, were £143,596 less than in the preceding month, while imports at £966,212, mark a decrease of £66,299 on the September figure. As compared with October, 1921, the export total for the month under review is £87,320 more, and imports are greater by £101,349.

Imports of Chemicals

A comparison between quantities imported in October and September of this year respectively, shows that increasing quantities of potassium compounds, other than nitrate, calcium carbide, borax and zinc oxide, have come into this country; a considerable falling off in the importation of sodium nitrate, potassium nitrate and tartaric acid is also indicated.

The detailed import figures, in cwts. unless otherwise stated, are given below, with the September figures in parentheses :—INCCREASES : Acetic acid including acetic anhydride, 695 tons (528) ; borax, 5,621 (3,003) ; calcium carbide, 77,769 (59,043) ; red lead and orange lead, 3,707 (3,629) ; potassium compounds other than nitrate, 608,513 (361,446) ; sodium compounds other than nitrate, 18,939 (16,108) ; and zinc oxide, 557 tons (501). DECREASES : Tartaric acid, including nitrates not elsewhere specified, 1,335 (3,821) ; bleaching materials, 2,775 (4,815) ; crude glycerin, 5,225 (6,346) ; distilled glycerin, 236 (593) ; potassium nitrate, 3,640 (24,343) ; sodium nitrate, 63,570 (106,755) ; and cream of tartar, 2,454 (3,081).

Recovery in Sodium Sulphate

An increase under sodium sulphate, which did not, however, extend to the other sodium compounds, is one of the features of the export side, although it will be noted that potassium compounds all show a very substantial improvement on the previous month's figures. Tartaric acid and copper sulphate are the only other commodities in which an appreciable recovery is visible. Chief among the decreases which are to be noted in the exports of chemicals is that of tar oil and creosote, although sulphuric acid, ammonia chloride, glycerin, zinc oxide, sodium compounds and sulphate of ammonia all stand lower. Shipments of the latter were 5,214 tons below the September figure. Of the October total of 9,659 tons, of the declared value of £164,559, Spain and the Canaries again took the largest proportion, although the present figure, 4,221 tons, is 2,560 tons below the September intake. The Dutch East Indies came next with 2,376 tons (as against 441 tons in September), and was followed by France, with 1,141 tons ; Italy, with 358 tons ; and the British West Indies, with 132 tons. Japan again took no supplies from this country, and in this connection it is interesting to note that she has only had 255 tons during the ten months ended October 31, as compared with 6,447 tons and 15,660 tons for the corresponding periods of 1921 and 1920 respectively. Other countries, which are not enumerated, imported 1,431 tons.

The following figures show in detail the products, the September exports of which were larger (as to quantity) than in the preceding month ; the September totals are given in parentheses and the figures represent cwts. unless otherwise stated :—Tartaric acid, including tartrates not elsewhere specified, 1,277 (757) ; benzol and toluol, 5,906 galls. (4,048) ; naphtha, 2,486 galls. (1,446) ; naphthalene, 4,908 (3,800) ; copper sulphate, 842 tons (554) ; potassium chromate and bichromate, 1,801 (1,153) ; potassium nitrate, British prepared, 1,373 (881) ; potassium compounds, other sorts, 2,911 (1,754) ; and sodium sulphate, including saltcake, 264,772 (185,235).

The decreases, similarly compared, are :—Sulphuric acid, 898 (1,020) ; ammonia chloride (muriate), 450 tons (775) ; sulphate of ammonia, 9,659 tons (14,873) ; bleaching powder, 22,325 (24,376) ; carbolic acid, 13,454 (19,907) ; tar oil, creosote, etc., 500,655 galls. (3,701,914) ; coal tar products, other sorts, 18,561 (31,130) ; crude glycerin, 120 (266) ; distilled glycerin, 8,216 (8,408) ; sodium carbonate, including soda crystals, soda ash and bicarbonate, 381,299 (461,227) ; caustic soda, 113,608 (120,791) ; sodium chromate and bichromate, 1,785 (2,059) ; sodium compounds, other sorts, 44,746 (48,099) ; and zinc oxide, 172 tons (209).

Dyes and Dyestuffs

Although the large increase in the importation of dyes recorded last month has not generally been continued, the import figures are of considerable interest on account of the receipt of 7 cwt. of synthetic indigo, this being the first importation recorded during the present year. In October last year 1 cwt. was imported, and the total for the ten months to October 31 was 7,081 cwt. The September figure for coal tar intermediates (6 cwt.—the highest during the year) has been exceeded by 1 cwt., and the total imports so far are 16 cwt., as compared with 4,899 cwt. in the corresponding period of 1921.

The comparative figures for October and September this year are, respectively :—Coal tar intermediates, 7 (6) ; alizarine, 560 (1,059) ; synthetic indigo, 7 (nil) ; finished coal tar dyestuffs, other sorts, 3,249 (5,071) ; cutch, 5, 690 (2,214) ; extracts for dyeing, other sorts, 10,115 (7,940) ; natural indigo, 78 (80) ; and tanning extracts, 59,833 (92,934).

Exports of dyes and dyestuffs were 470 cwt. less than in September. The total of 4,036 cwt. (as against 9,506 in September), made up of 4,237 cwt. of coal tar products (as against 4,993) and 4,799 cwt. of other sorts (as against 4,513) was valued at £64,890, whereas the previous month's total only amounted to £52,763, so that although the actual quantity exported was 470 cwt. smaller, the value was £12,127 greater.

Painters' Colours and Materials

Imports of painters' colours and materials, with the exception of white lead, were again lower, the falling off in barytes being very pronounced. Although exports of white lead and unenumerated materials were lower, the bulk was 1,073 cwt. in excess of the September total. The comparative figures are :—IMPORTS : Barytes, ground, including blancfixe, 25,109 (63,237) ; white lead (basic carbonate), 10,044 (9,835) ; painters' colours and materials, other sorts, 42,013 (49,044). EXPORTS : Barytes, 5,322 (4,903) ; white lead, 15,019 (17,289) ; paints and colours ground in oil or water, 20,272 (15,750) ; paints and enamels prepared, including ready mixed, 19,544 (17,085) ; and painters' colours and materials, other sorts, 41,523 (45,580).

British Association of Chemists

Questionnaire on Political Programme

WITH the object of furthering the interests of chemists in general in matters political, the British Association of Chemists sent to all General Election candidates a questionnaire regarding the attitude to be taken in connection with fourteen points which form the political programme of the Association. This programme includes better remuneration for scientific workers in Government employ, the restriction of Government contracts to firms employing chemists at a scale of remuneration fixed by the Association ; the establishment of a legal distinction between the terms " chemist " and " pharmacist " ; the establishment of a statutory register of all qualified chemists ; the allocation of adequate public funds for scientific research ; the reform of the patent laws ; and the reform of the Income Tax Regulations as affecting chemists.

THE CHEMICAL AGE was informed by an official of the Association that the following candidates promised to support the B.A.C. programme in the event of their election : C. Buchanan Alderton, Sir Robert Kay, Mary P. Grant, J. H. Whitehouse, F. Coysh, Lieut.-Com. Kenworthy, G. S. Tetley, W. N. Dickinson, Sir G. Paish, C. S. Rewcastle, L. S. Fletcher, J. C. Nicholson, R. Alstead, S. Cope Morgan, Gordon Liverman, J. W. Molden, R. Kirby, H. Arnold, Capt. G. Garro Jones, T. Wiles, C. R. Cooke-Taylor, Arthur Morris, Sir W. Milligan, O. A. Minns, John Neal, Capt. C. E. Loseby, Rt. Hon. H. A. L. Fisher, M. Warner, Rear-Adml. T. Fisher, H. Philipson, J. E. Harper, Major Malone, J. Lort Williams, Thomas Watts, Sir Rowland Blades, F. C. Harrison, N. Grattan Doyle, A. Willey, Capt. A. Hudson, C. S. Garland, Sir Edwin Stockton, Dr. G. C. Clayton, A. Instone, J. D. Robertson, G. W. H. Jones, D. Dalziel, Col. Leslie Wilson, H. G. Williams, T. Proctor, W. A. Chambers, Will Thorne, P. C. Hoffmann, A. Henderson, T. Cape, H. J. Jarrett, J. G. Dale, G. Horne, A. Lynch, F. W. Pethick Lawrence, W. A. Hodgson, J. P. Hay, John Watts, A. B. Mackay, Dr. Ethel Bentham, Jack Palmer, R. Williams, Dr. H. B. Morgan, Alderman A. Emil Davies, Major A. G. Church, C. R. Morden, L. Spero, A. J. Penston, W. Albery, J. Williams, E. W. Wilton, F. Bartle, Rear-Adml. Drury-Lowe, C. Jesson, J. A. Seddon.

Orcinol: Its Properties, Derivatives and History

By John Missenden

ORCINOL may be best recognised by a few characteristic changes that occur in its appearance when treated by a few simple substances. In contact with ammonia, for instance, it is converted entirely into orceïn, assuming a deep purple colour; bleaching powder will produce a red which ultimately becomes a yellow; and ferric chloride produces an almost black body.

The chemical formula of orcinol is $C_6H_3(CH_3).(OH)_2$. (1 : 3 : 5) and all its compounds (with the exception of orcinol-azobenzene; *q.v.*) are of the $C_6H_3(CH_3)$ order. When heated rapidly it distils at about 288° C., and the operation is entirely unaccompanied by decomposition. It is a crystalline body of the hexagonal-tabloid order, is soluble in water, ether, and alcohol, and each crystal incorporates one molecule of water. Over sulphuric acid the crystals become anhydrous, the change being accelerated by the application of heat. Orcinol has a very sweet taste, and will reduce a solution of ammoniac-silver. It may be crystallised from a solution of sodium chloride in elongated pyramoids which, in their anhydrous state, melt at 107·3° C.

DERIVATIVES.—*Orcinol acetate*, $C_6H_3(CH_3).(O.C_2H_3O)_2$, is a crystalline body of the elongated pyramoid order, which has a melting point of 24·45° C. It may be produced by treating orcinol with acetyl ether.

Orcinol monomethyl ether, $C_6H_3(CH_3).(O.CH_3).OH$, is a viscid body, tinted with yellow, and soluble in all alkalis. It boils at 285° C., and may be produced by boiling together ethyl alcohol, caustic potash, orcinol, and methyl iodide, one of the by-products being *orcinol dimethyl ether*, $C_6H_3(CH_3).(O.CH_3)_2$. This last is similar in appearance to the monomethyl compound, but has a slightly lower point of ebullition (viz., 249° C.). Another difference is that it insoluble in alcohol.

Orcinolazobenzene, $C_6H_5N=NC_6H_2(CH_3).(OH)_2$, is a crystalline body of the elongated pyramoid order, and has a distinguishing red colour. It may be best separated out from a mixture of ethyl acetate and acetic acid, and is produced by mixing together solutions of diazobenzene nitrate and orcinol. Its melting point is 188·5° C.*

Orcinol diethylcarbonate, $C_6H_3(CH_3).(O.CO.OC_2H_5)_2$, is a viscid liquid with a boiling point of 313° C. It is produced by treating a potassium compound of orcinol with chlorocarbonic ether.

DETECTION AND ESTIMATION.—The most sensitive test for orcinol, by means of which it may be detected in the lichens, no matter how minute the quantity, is to heat the suspected body with chloroform. If the least trace of alkaline orcinol be present, the liquid assumes a bright red colour which changes to a green upon the addition of water. This green liquid will contain homofluoresceïn, $C_{23}H_{18}O_5$, the chief colouring body.

The constitution of orcinol was determined by the analysis of orcinol dimethyl ether,† this compound having been converted into dimethoxybenzoic acid (dimethyl-α-resorcylic acid), $C_6H_2(O.CH_3).CO_2H$ (5 : 3 : 1), by means of oxidation.

Orcinol may be quantitatively estimated by mixing its solution with aqueous bromine. The proportions should be so adjusted that all the tribromorcinol is precipitated, thus leaving the excess of bromine to be easily determined.

SOURCES.—The various orders of *Variolaria* (*i.e.* the *Variolaria dealbata*, also known earlier as *Lichen orcina*), *Rocella* and *Lecanora* all contain orcinol in the free state, and these lichens are now used for the production of the two substitution products, litmus and archil. In addition to being obtained in the free state, orcinol likewise exists in the many acids and ethers distilled from the lichens, and may be chiefly produced by the decomposition of *orsellinic acid*, $C_7H_5(CO_2H).(OH)_2$, thus :—

$C_{20}H_{16}O_4.(OH)_6+2H_2O=2C_8H_6O_2.(OH)_2+C_4H_6(OH)_4$;
$C_{16}H_{11}O_4.(OH)_3+H_2O=2C_8H_6O_2.(OH)_2$; and
$C_8H_6O_2.(OH)_2=C_7H_6.(OH)_2+CO_2$.

Here it will be seen that orcinol is respectivley produced from erythrin and lecanoric acid.

It may be best prepared by crushing 5 parts of *Rocella fuciformis* with 55 parts of lime lactate and 2 parts of lime. The mush obtained should be filtered, and the filtrate treated with hydrochloric acid to precipitate the erythrin. This last substance is then heated with an alkali, resulting in the action described *ut supra*.

Orcinol was first discovered in 1828 by Robiquet, who named it orcin, because he produced it from the *Lichen orcina*, and since then it has been investigated by many chemists,‡ the investigations of Neville and Winther§ and Henninger and Vogt‖ being of great importance.

Neville and Winther produced orcinol by melting in one container caustic potash and bromotoluenesulphonic acid (the latter compound being a product of orthotoluidinedisulphonic acid). A second method they employed was to heat caustic potash with metadibromotoluene and water. Henninger and Vogt obtained orcinol by the chlorination of iodo-toluene, and heating the resultant liquid to 100° C. with a considerable excess of sulphuric acid. Barth and Hlasiwetz¶ also produced orcinol by fusing caustic soda with aloes; a by-product being parahydroxybenzoic acid.

Sequel to Deals in Acetic Acid

R. MASSEY and M. Winbury, Merchants, 17, Queen Victoria Street, London, who were adjudged bankrupt in September, 1921, applied to Mr. Registrar Francke at the London Bankruptcy Court on November 10 for their order of discharge. The Official Receiver said that although the debtors only estimated their liabilities at £2,589, proofs of debt for £8,281 had been admitted, the difference between the two amounts being due to their having under-estimated the claim of the petitioning creditor, and omitted that of another creditor. The trustee in bankruptcy had realised £534 on account of the joint estate and a dividend of just over 1s. 1d. in the £ was likely. The debtors entered into partnership in June, 1919, and carried on business as importers and exporters at 17, Queen Victoria Street, E.C., under the style of Massey and Winbury. The business was successful, and in September, 1920, they transferred it to a company called Massey and Winbury, Ltd., with a view to obtaining further capital. They were appointed joint managing directors at £1,000 per annum each, and they held that position until March 14, 1921, when the company went into voluntary liquidation. Before the formation of the company they had entered into several contracts for the purchase of glacial acetic acid from the petitioning creditor, but later on refused to accept delivery. In consequence, judgment was obtained against them in respect of damages for breach of contract. They attributed their insolvency to the failure of Massey and Winbury Ltd., to general depression in trade, to financial causes and to inability to recover book debts. The Official Receiver further reported that in the directors' statement of affairs Victor Blagden and Co. were entered as unsecured creditors for £2,589 damages for breach of contract under a judgment. The debtors said that before the formation of the company they had transacted a lot of business with that firm, and that during that period Mr. Massey had entered into contracts for 40 tons of glacial acetic acid for delivery in monthly periods, and that at the time the contracts were entered into none of the acid was in this country. A considerable fall in the price of chemicals, however, took place, and they found that they had bought more acid than they could pay for. Although none of the acid had then been tendered for delivery Victor Blagden and Co. issued a writ on March 17, 1921, claiming £4,519 for acid contracted to be bought. The debtors said that they considered that it was a case for arbitration, but they afterwards consented to judgment for damages. The only offence against the Bankruptcy Act alleged by the Official Receiver was the insufficiency of the debtors' assets to pay 10s. in the £ to the unsecured creditors, and his Honour suspended their discharge for three weeks.

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* Typke (*Ber. Deut. Chem. Ges.*, x, 1579) gives this figure as 183° C.

† Tiemann and Streng, *Ber. Deut. Chem Ges.*, xiv, 1999.

‡ Stenhouse, *Phil. Trans.*, 1848, 63; 1849, 393. Gerhardt, *Compt. Rend.*, 1845, 287. *Ann. Chem. Pharm.*, Schunbe, xli, 159; Dumas, xxvii, 140.

§ *Ber. Deut. Chem. Ges.*, xv, 2976.

‖ *Ann. Chem. Pharm.*, clxv, 366.

¶ *Ann. Chem. Pharm.*, cxxxiv, 288.

Some American Publishing Methods

Impressions of the New York Conference

At a meeting of the Council of the Weekly Newspapers and Periodical Proprietors' Association, held at 6, Bouverie Street, London, on Tuesday, Mr. George Springfield (in the absence of Lord Riddell) welcomed the delegates from the Association who had attended the recent Conference of the Associated Business Papers of America in New York, and invited them to express their views as to their experiences during the tour.

Mr. F. E. Hamer (Benn Brothers, Ltd.) said that all his colleagues were agreed that Lord Riddell's prediction before they left that they would have the time of their lives had been fully realised. Not only were they received with wonderful hospitality in every part of the country, but everywhere the warmest feelings were expressed towards Great Britain. Intense interest was shown in the British political and industrial situation and the desire to emphasise the unity of the English-speaking people on both sides seemed universal. Although one school of American economists advised America to keep to herself and not get entangled in the European mess, as a matter of fact considerable pains were being taken to interest the people in the Middle and Far West in the problems of international trade, and to make them realise that America could not isolate herself from the industrial world. The Conference they attended lasted three days and the discussions covered the whole field of newspaper production, dealing especially with advertising, circulation, and editorial matter. At the close of the Conference a most cordial vote of thanks was given to the British delegates for their assistance and repeated suggestions were made that the interchange of visits should become an annual event. One of the points most emphasised in the discussions was the increasingly important part the business paper should take in influencing public policy. The Americans struck him as in some respects a very simple-minded and open-minded people who were considerably influenced by popular slogans, and the particular slogan the most heard at the Conference was, "This is the day of the business paper." That was thoroughly rubbed into all the delegates present, and it seemed to be one way in which America had built up its wonderful advertising habit. Not only was Press advertising on a much more extensive and elaborate scale than in this country, but the private publicity services were on a scale not even approached over here. Another matter which impressed him was the extent to which Government Departments and Officials cultivated Press publicity. Probably this was explained by the fact that in order to get an appropriation from Congress in aid of their Departments they had to make a good public show, and the result was that instead of grudgingly doling out bits of information, they were only too glad to get as much notice as possible in the public Press. This connection between the Government and the Press had been considerably developed by Mr. Hoover, head of the Department of Commerce, who had instituted a series of monthly conferences at Washington with trade and technical editors. The proceedings were entirely informal; the editors were free to raise any questions of public interest, and Mr. Hoover dealt with them with the utmost frankness, trusting entirely to their good sense and discretion without hampering them with any sort of restriction. It was gratifying to hear that his confidence had never been abused and that he had never been let down. The result was a perfect understanding and great public benefit to both sides, Mr. Hoover being kept informed of the drift of public opinion and the editors getting accurate information as to Government proposals. His own impression was that labour conditions would presently become a rather serious problem for America. They intensely disliked the idea of restricting output or of standardising work, and seemed disposed to stand very firmly for individual liberty in industry. In going through the *New York World* office he noticed several linotype machines being operated by women, and when he suggested that a similar innovation in England would lead to a national strike, the idea was regarded as nonsense. While American newspaper organisation was on an immensely larger scale than ours, because the field was larger, and the American was less hampered by tradition and precedent than the Englishman, taking them man for man he did not think that America could give us very many points. Though in appearance and size their journals greatly exceeded ours, he believed they had a sneaking respect for British standards of quality, and it required no great vision to discover the real admiration and respect which the American felt for solid British workmanship and British character.

Mr. Hamer added that it was extremely gratifying to find The Chemical Age so well known, and so much appreciated everywhere he went, and the warmth of his personal reception was embarrassing. The firm of Benn Brothers, Ltd., was popularly known in America as the McGraw-Hill Company of England. Sir Ernest Benn's previous visit had obviously been a great success, and with the increasing demand for Benn Brothers' technical and art books the firm appeared to have a great field in the United States.

The Chairman thanked the delegates for their reports, and suggested that in the event of an American Press deputation coming over next year, the two Associations might jointly arrange to give them a thoroughly British welcome.

Chemical and Dyestuff Traders

Merchants and Reparation Dyestuff

The Chemical and Dyestuff Traders' Association issues the following:—

The distribution of Reparation dyestuffs having been transferred by the Board of Trade from the Central Importing Agency to the British Dyestuffs Corporation the Chemical and Dyestuff Traders' Association addressed a letter to the Board pointing out that if merchants by this arrangement were deprived absolutely from trading in dyestuffs and colours it would create a legitimate grievance. The letter continued: "It must be borne in mind that the Dyestuffs Act creates an absolutely new situation. So far as traders are concerned it is practically a complete embargo on importations. Prior to the war if traders were not able to buy certain dyestuffs here they could always—through one source or another—obtain supplies abroad and there was no difficulty in importing into this country either for home consumption or for re-exportation.

"The total volume of such trade done by some firms was quite considerable. At present it is completely stopped by Government action. If no provision is made for them with regard to the distribution of Reparation dyestuffs here they are obviously compelled to take advantage of the surplus Reparation stocks that can be bought freely on the Continent," and suggested that a discount of 5 per cent. should be allowed to the merchant, as "if such traders are driven to buy their supplies abroad, shipment is made per foreign steamers and in many aspects—including employment and taxation—our national interests are prejudiced.

"In view of the fact that traders in chemicals and dyestuffs have been severely hit by Government action, and bearing in mind that they have had to pay their quota to the subsidising of British makers—especially the British Dyestuffs Corporation who are now the official distributors of imported dyestuffs—and that they share the common burden of excessive taxation and inflated overhead charges, it is surely not unreasonable that the Board of Trade should agree that such traders have the right of continued existence, especially when there is no suggestion whatever that any user should be prejudiced or should have his freedom of action impaired but rather contrarywise."

Board of Trade's Reply

On November 8 the following reply was received from the Board of Trade:—"With reference to your letter of October 24 regarding the arrangements for the distribution of dyestuffs obtained from Germany as Reparation, I am directed by the Board of Trade to state that they have given careful consideration to the representations made in your letter and in previous communications to the effect that special facilities by way of a discount should be extended to merchants purchasing quantities of dyestuffs from the Reparation stocks, and they are prepared to extend the proposals outlined in the notice which appeared in the Press on September 27, so that the rebates referred to for quantities of not less than 4 cwt. shall apply not only to orders of any one particular dyestuff, but also to orders for one or more dyestuffs placed simultaneously, but amounting in total to more than 4 cwt. The Board are, however, unable

to see their way to institute any general system of discount to merchants irrespective of the quantities purchased."

It will thus be seen, adds the Association, that the same terms apply to merchants as to users. No advantage is given to the merchant when wishing to purchase for re-export. It seems to be the fixed policy of the Board of Trade to ignore the merchant as far as possible in all matters relating to legislation connected with dyestuffs and the Safeguarding of Industries Acts.

Characteristics of British Clays

Clay Purification by Electrolytic Osmosis

On November 8 Mr. A. Trobridge presided over a meeting of the Newcastle Section of the Society of Chemical Industry, when Mr. Arthur E. Brown delivered a lecture on "Clay."

Mr. Brown traced the history of brick making from earliest times. The earliest bricks found were at least 12,000 years old. The extensive use of bricks in this country commenced after the Fire of London, and the industry was growing until checked by the war, when fire bricks only were in demand. The industry had not yet been re-established, and the Ministry of Health had expected miracles in brick making which had not occurred. He then described the various clays found in this country and their different characteristics. For London clay as a brick-making material he had little to say. It had been the cause of heavy losses to railway companies because of its irritating tendency to slip, and rash brick makers had rushed in where experts would have told them not to tread.

The chemistry of clay was a most disappointing study, said Mr. Brown, as the information was very meagre; the primary question of composition being not really solved. There was little difficulty in making ultimate analyses of samples of clay, but such analyses told them little of the properties. As an example, he gave the following analyses of two samples of clay:—

	Silica	Alumina	Iron Oxides	Lime	Alkalines	Water
(*a*)	51	28	1·5	0·5	1	19
(*b*)	52	28	1·5	0·5	1·5	16

There was not a great deal of difference in the two analyses, yet the first was of London clay, which was a most unpractical material, and the second was of a good Scottish fire clay, and they would know there was a considerable difference in the properties of the two materials.

The chemist played but little part excepting in the pottery and sanitary ware trades. There was there a great difference between the price of the raw material and the finished product, whereas the margin between the raw material of the ordinary brick and the finished product was very small. By diagrams he described the purification of clay by the electrolytic osmosis process, and described at length the various kilns which have been and are used in the brick-making industry. Incidentally, he did not at all agree with the view that a coal-fired kiln could not be properly regulated, holding that some modern coal-fired kilns could be regulated to the last degree. He insisted that when mechanical disruption was employed a period of rest was essential during the manufacture. In one case clay which had been undisturbed for centuries was ground and had to rest at least five days or the finished product was a failure. That necessity for rest had not been sufficiently realised.

Droitwich and the Salt Industry

Strong protests were made at the annual meeting of the Droitwich Town Council on November 9 against the removal of the salt industry from Droitwich, where it has been carried on for over a thousand years. The Mayor stated that the last of the few works were being dismantled. The last 100 salt operatives had been transferred to Stoke, the Worcestershire centre of operations of the Salt Union Co., and the latter had placed sixty men on pensions. It was also stated that although Droitwich possessed the finest brine in the world not an ounce of salt was to-day made in the borough. The hope is entertained that salt works may again be opened, but the general view is that the development of the town must be on he lines of a spa.

Affairs of a Manufacturing Chemist

Mr. J. H. R. Hex, 12, Regent Square, London, W.C., who had been interested in a manufacturing chemist's business, attended before Mr. Registrar Francke at the London Bankruptcy Court on November 10 for his public examination on a statement of affairs in which he returned his liabilities at £704, of which £641 were expected to rank, and his assets at a net amount of £152. It appeared that in February, 1920, the debtor registered Shepperleys (London), Ltd., with a nominal capital of £1,000, afterwards increased to £4,000, with the object of acquiring the business of a manufacturing chemist, then being conducted at Nottingham. As consideration for services rendered he was allotted 1,334 shares as fully paid, and appointed managing director at a remuneration of £200 per annum. In June, 1921, he registered another company called Shepperleys Manufacturing Chemists, Ltd., with the object of manufacturing patent medicines, and acquiring the assets of the previous Shepperley company. However, at the date of the receiving order the company had not received its certificate to trade. In July last, after having carried on business as a pharmacist in various places, he registered a company called British Pharmacies, Ltd., with a nominal capital of £2,000. He transferred the business to the company, and received as consideration some shares and the appointment of managing director. The debtor had also carried on business with two other persons as general merchants and agents, under the style of Hex, Read and Co., in Chancery Lane, London. He attributed his insolvency to his having guaranteed a debt on behalf of another person, for which he received no consideration, and to the delay in the issuing of the trade certificate to the company known as Shepperleys Manufacturing Chemists, Ltd. The examination was adjourned until December 8, it appearing that the debtor had lodged a fresh proposal, and that a new meeting of his creditors would be called to consider it.

Investigation of Mineral Fillers

In the course of the investigation of mineral fillers being made by W. M. Weigel, mineral technologist, at the Southern experimental station of the Bureau of Mines, Birmingham-Tuscaloosa, Alabama, three special problems have been studied, viz.: determination of grain size fillers, involving elutriation and microscopic measurement, followed by methods of calculation; the effect of heat treatment on the physical properties of white clays with respect to their use as fillers, and the utilisation of Alabama flake graphite. The size of particle is a basic property of fillers upon which many of the other physical properties depend, consequently considerable work is being done in this direction. Work has been completed on the study of the effect of heat treatment on the physical properties of clays. The lubrication tests on graphite were satisfactory, while results of the moulding tests were negative. Experiments in the use of graphite as a remover of boiler scale were only partly satisfactory, being partly negative. A special investigation has been made of a series of clays from central Georgia and western Georgia with respect to their value as fillers.

Asbestos and Some of its Products

Reading a paper on the above subject, at a meeting on Monday of the Birmingham University Chemical Society, Mr. R. B. Tunstall first outlined the chemical composition and theories concerning the origin of the many varieties of asbestos, describing in detail anthophyllite, amphibole and serpentine, the three principal asbestos minerals. The methods of quarrying the fibre in the Canadian mines were described and illustrated with lantern slides and the processes undergone by the raw material in the course of manufacture described. Asbestos in all its grades, the lecturer showed, was used extensively in all departments of science and industry, particularly for heat and electrical insulation, as a lubricant in gland-packing and in building. Next to coal it was undoubtedly the most important non-metallic mineral, and in the near future its commercial value would be greatly increased as more uses were discovered. The lecturer exhibited some eighty specimens, illustrating asbestos manufacture from the mineral to the finished products.

From Week to Week

MAJOR E. P. NICHOLLS has been elected Master of the Distillers' Co.

AT CAMBRIDGE UNIVERSITY, the General Board of Studies have recommended the establishment of a readership in Biochemistry.

COUNCILLOR STANLEY A. SADLER, managing director of Sadler and Co., chemical manufacturers, Middlesbrough, has been elected Mayor of Middlesbrough.

CABLED ADVICE received from Chile by the Lastenia Nitrate Co., is to the effect that no damage has been done to the company's property by the recent earthquake.

THE ANNUAL REPORT for the financial year ending May 31, 1922, has been issued by the Sulphate of Ammonia Federation. Further reference to it will be made next week.

THE SEMI-JUBILEE of the opening of the Brunner Guild Hall, Runcorn, was celebrated by a public gathering, at which a memorial portrait of the late Sir John Brunner was unveiled.

S. COOKE AND SONS, LTD., and Troughton and Simms, Ltd., both of London, have amalgamated their businesses and the company will in future be known as Cooke, Troughton and Simms, Ltd.

AN INCREASE of capital to 5,000,000 lei has been made by the "Zea" chemical factory at Cluj, the capital of Transylvania, in order to allow the company to manufacture fine chemicals in addition to its other products.

A PETITION for the winding up of Sapon Soaps, Ltd., by the High Court of Justice, presented by Mr. V. C. North and Mr. A. W. Hings, carrying on business under the style of V. C. North and Co., will be heard on November 21.

MR. D. R. NANJI has been appointed lecturer and demonstrator in the department of brewing and the biochemistry of fermentation and Dr. E. Ashley Cooper lecturer in public health chemistry at the University of Birmingham.

IT IS REPORTED that the German Dye Trust has again increased the price of aniline dyes, this time by 60 per cent. The Federal Potash Council has announced an increase of 92 per cent., while prices for nitrates have also been raised.

H.M. TRADE COMMISSIONER at Toronto has furnished to the Department of Overseas Trade a report of a visit which he paid to Northern Ontario in September. He states that there is a good demand in that district for chemicals for use in mining operations.

MR. H. S. NAYLOR, managing director of Naylor Brothers (London), Ltd., paint and varnish manufacturers, Slough, has been elected Chairman of the London Section of the National Federation of Associated Paint, Colour and Varnish Manufacturers of the United Kingdom.

A LENGTH of green window curtain, woven in Lancashire and dyed with Lancashire dyestuffs, has been sent to Mr. Lloyd George by a group of Lancashire women in the dye industry, "as a token of the achievements made in an industry which you have done so much to foster."

FOR FAILING to provide sufficient overalls for the persons engaged in a lead process on their premises, and for carrying on a lead process without an efficient exhaust draught to carry off dust and vapour, the Burnett Motor Tyre and Rubber Co., Trowbridge, were fined £2 on each count.

EXAMINATIONS for the Associateship and Fellowship of the Institute of Chemistry will be held during the weeks commencing January 8 and 15. The list of candidates will close on Monday, November 27. Intending candidates can obtain full particulars from the Registrar of the Institute.

A FIRE at the Abadan refinery of the Anglo-Persian Oil Co. was quickly got under control and has been restricted to a small section of the refinery. Throughput will necessarily be interfered with temporarily, but every effort is being made to limit the interruption and to resume normal working with as little delay as possible.

SO FAR, £125 10s. has been subscribed to the second appeal on behalf of Russian men of science, issued by the President of the Chemical Society in September. Further donations of gifts of clothing and boots and recent chemical literature are urgently needed, and may be sent to the assistant-secretary, Chemical Society, Burlington House, Piccadilly, London.

WHAT IS BELIEVED to be the remains of an ancient smelting plant has been discovered near Leeuwpoort, South Africa, while a further search is said to have revealed a substantial ore body of high specific gravity. While the nature of the ore is not yet known, it is thought that it may be platinum. Indications point to the ore having been worked hundreds of years ago.

AFTER SEVERAL HEARINGS, an action in which Mr. A. Ashworth claimed damages for alleged wrongful dismissal from Joseph Ashworth and Sons, Ltd., oil cake and fertiliser manufacturers, Frodsham Bridge, Cheshire, was settled, the plaintiff having withdrawn allegations against officers of the defendant company, while the defendants have substantially met the plaintiff's monetary claims.

AMONG the exhibitors at the Manchester Chemists' Exhibition which opens on November 20, are the Grafton Chemical Co.; Charles Harrison and Sons, Ltd.; Howards and Sons, Ltd.; International Chemical Co., Ltd.; Leonards, Manufacturing Chemists, Ltd.; Meldrums, Ltd.; Premier Drug Co., Ltd.; the Thermal Syndicate, Ltd.; Whitaker and Co.; and Charles Zimmerman and Co. (Photographic), Ltd.

WALKER, CROSWELLER AND CO., of Dane's Inn House, 265, Strand, London, are among the exhibitors at the Engineering Exhibition at Cardiff, which will open on Monday next and will continue until November 25. The firm will show several of their "Arkon" gas analysis recorders, including their oxygen recorders, and also a wide range of "Arkon" indicating and recording draught and pressure gauges.

HAVING carefully considered the twenty-three papers available for the award of the Dyers' Company's Research Medal, from July, 1920 to June, 1921, the Committee of Adjudication appointed by the Society of Dyers and Colourists are unanimously of opinion that the award should be made to Professor G. T. Morgan, F.R.S., for his paper on "The Co-ordination Theory of Valency in Relation to Adjective Dyeing."

IN THE SCOTTISH LAW COURTS judgment has been given by Lord Blackburn in an action by Brotherton and Co., Ltd., ammonia and tar distillers, City Chambers, Leeds, against the Glasgow Corporation. The pursuers, in October, 1904, entered into a contract whereby they acquired from them right to chemical works appertaining to the Corporation Gas Works at Provan, Glasgow, and also right to the tar and ammoniacal liquor. A third contract extended the duration for an indefinite period from the year 1914. The Corporation took over the chemical works on July 31, 1920, and carry them on with their own manager. The parties were at issue as to the construction of an article of the contract which dealt with the price to be paid by the pursuers for the tar and ammoniacal liquor. His Lordship said that it might be that Brotherton and Co., under war conditions, found themselves burdened by a contract, but they did not take the steps available to them to end it. Their action at law, now, was based upon an erroneous construction of the article. He accordingly repelled the whole of their pleas in law, and assoilzied the Corporation.

Chemical Investigation of Motor Fuels

FIRST efforts to ensure future supplies of motor fuels and oils have been started by a special committee of the American Chemical Society which has undertaken the task. The problems which have been selected for immediate investigation include (1) Thorough scientific investigation of fractionating columns. (2) Preparation of rational specification for petroleum products, such specifications to be based on actual research work. More national volatility specifications for gasoline, and tests for "oiliness" of lubricants. (3) Investigations as to the actual need of highly-refined gasoline for motor fuel; is it necessary to remove bad smelling sulphur compounds completely in order to obtain efficient service from the gasoline? Will these compounds injure the engine? (4) A study of the fundamental causes of carbon formation in cylinders; effect of addition agents. (5) A thorough study of lubrication from a colloid chemical standpoint. (6) The chemistry of petroleum hydrocarbons, particularly of the higher homologues. (7) The chemistry of the sulphur, nitrogen and oxygen compounds in petroleum. (8) The chemistry of sulphuric acid in refining of oils. (9) The causes and mechanism of colour changes in oils. The work is to be directed by the American Petroleum Institute, the petroleum section of the American Chemical Society helping in an advisory capacity only.

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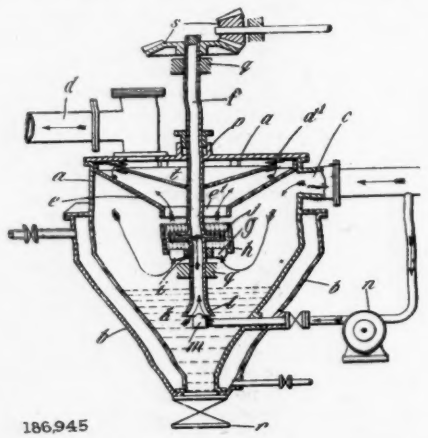
Abstracts of Complete Specifications

186,945. Gases, Oil Vapours, or Gaseous Mixtures: Method and Apparatus for the Treatment of. J. F. Ward, 50, Elgin Crescent, London, W.11. H. Nielsen, 13, Firs Avenue, Muswell Hill, London, N.10, and B. Laing, Abdale House, Hatfield, Herts. Application date, March 31, 1921.

The apparatus is for bringing a gas or vapour into intimate contact with a liquid which may contain a catalyst in suspension, to effect a reaction with the gas or to absorb certain constituents from the gas. The apparatus *a* is surrounded by a jacket *b* for maintaining a constant temperature, and the gas or vapour is admitted at a high speed through tangential inlets *c*. A conical baffle plate *e* is provided in the central opening e^1, above a perforated screen or basket *h*. A hollow rotary shaft *f* carries propellers *g* below the basket *h*, and radial open-ended tubes *j* project into the basket. The lower end of the shaft *f* is flared at *l*, and compressed gas supplied by a pump *n* is injected into it from a nozzle *m*. The circulating stream of gas passes



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downwards through the vessel *a*, and is then projected upwards by the propeller *g* into the basket *h*. At the same time the liquid *k* is drawn up into the tube *f* and sprayed from the revolving tubes *j*. The liquid may be continuously discharged from the apparatus, and fresh liquid supplied to it, while two different gases may be supplied through the pipe *c* and injector *m* respectively. The gas is finally delivered around the splash plate *t* to the outlet *d*. The apparatus is applicable for the absorption of sulphur compounds in the hot state from gases obtained by destructive distillation, and for the desulphurisation and hydrogenation and/or oxidation of gas or oil vapour by means of catalysts and/or oxidising agents suspended in the liquid. If unsaturated oil vapour is treated, it is found that the production of saturated vapour and the desulphurisation are facilitated by adding ammonia or a gas containing it, such as producer gas.

186,950. Viscous Oily Compositions, Manufacture of—and Treatment of Waxes for Use Therein. Plauson's (Parent Co.), Ltd., 17, Waterloo Place, London, S.W.1. From H. Plauson, 14, Huxter, Hamburg, Germany. Application date, April 13, 1921.

The process is for obtaining from mineral, vegetable or animal oils, viscous compositions for use as lubricants, leather oils, compositions resembling purified wool fat, etc. The oil is mixed with a wax or crude bitumen such as montan wax, ozokerite, beeswax, carnauba wax or Japan wax which has previously been treated with an aldehyde and an alkali as condensing agent. The treated wax is freed from alkali by washing with acidified water, and is then dissolved in the oil. The product is a thick lubricating oil, or transparent grease resembling petroleum jelly, depending on the proportion of wax added. Animal or vegetable oils may be similarly treated to yield medicinal or cosmetic products. The wax products may be rendered more effective by adding a ketone, such as acetone or methyl-ethyl ketone, during the reaction with aldehyde. The ketones may be replaced by divalent or trivalent alcohols (glycol, glycerol) to yield a product which is more effective in increasing the viscosity of the oil. The formaldehyde may be replaced by other substances such as acetaldehyde, furfurol, polymerisation products, or hexamethylene tetramine. Several examples are described.

186,955. Petroleum and Petroleum Distillates, Treatment of. A. E. Dunstan and F. B. Thole, Meadhurst, Cadbury Road, Sunbury-on-Thames. Application date, May 9, 1921.

Petroleum and petroleum distillates are desulphurised by using a highly adsorptive substance prepared by the dehydration of a natural or artificial inorganic gel. Varieties of fuller's earth such as floridin, and bauxite are suitable, or the gelatinous hydroxides of iron or aluminium may be dehyrated. The material is ignited and is used as a filtering medium for the oil while still at a temperature of about 200° C. It is found that a complete desulphurisation of benzene may be obtained by the use of 4 lbs. of floridin or 9 lbs. of bauxite per gallon.

186,960. Separating Saponaceous Matter from Lime Sludge, Process of. P. Krebitz, Pfeuferstrasse 40, Munich, Germany. Application date, June 3, 1921.

In the usual treatment of lime soaps obtained from animal fats, fish oil, olive oil, sulphur oil, and cottonseed oil, with soda solution, it is found that a substantial proportion of soap is left in the lime sludge and cannot be recovered. In this invention, there is added to the sludge before the usual treatment with water, either copra nut oil soap, palm kernel oil soap, or resin soap, in such proportion that the soap in the sludge contains 25 per cent. of copra nut oil soap or palm kernel oil soap, or 20 per cent. of resin soap. It is found that when lime sludge so treated is lixiviated with water the whole of the soap may be dissolved out. Several examples of the treatment of various kinds of soaps are given.

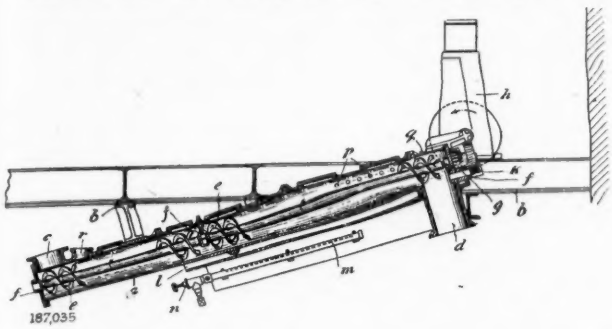
187,016. Sulphuric Acid, Process for the Production of. T. Schmiedel, 3, Herderstrasse, Nurnburg-Doos, Germany, and H. Klencke, 72, Schwanthalerstrasse, Frankfurt-on-Main, Germany. Application date, July 12, 1921. Addition to 149,648.

Specification No. 149,648. (See The Chemical Age, Vol. III, p. 543) describes the production of sulphuric acid without lead chambers and towers, by the oxidation of gases containing sulphur djoxide with a fine spray of a solution of nitrosyl-sulphuric acid in sulphuric acid of about 54°-58° Bé. The nitrosyl-sulphuric acid is present in excess throughout the system, and the quantity is maintained by washing out the evolved nitrous gases from the gas stream by a further quantity of the same solution. The amount of nitrosyl-sulphuric acid withdrawn from the system is limited, so that the excess of acid remaining is maintained. The sulphuric acid obtained is between the same limits of concentration, and if a stronger acid is required it is found that the temperature must be raised to 50°-90° C. as well as increasing the strength of the acid used in the process. A plant containing several units may be used in the process, in which the mixing chambers at the entrance and exit for the sulphur dioxide gases are supplied with an acid at 58° Bé, and the middle part of the plant is supplied with an acid of about 54° Bé.

187,035. Sulphate of Ammonia, Manufacture of. W. C. Holmes and Co., Ltd., and C. Cooper, Whitestone Iron Works, Huddersfield, and W. G. Adam, Tar and Ammonia Product Works, Beckton. Application date, July 16, 1921.

The apparatus is for producing neutral and dry sulphate of ammonia. A cylindrical chamber *a* of rectangular cross section, is inclined at an angle of 15° and is provided with an opening *c* at the lower end for the supply of the crude salt, and an opening *d* at the upper end for the discharge of the finished product. Two helical conveyors *e* are arranged parallel to one another in such a way that the circles of revolution of the blades slightly overlap one another. These conveyors are

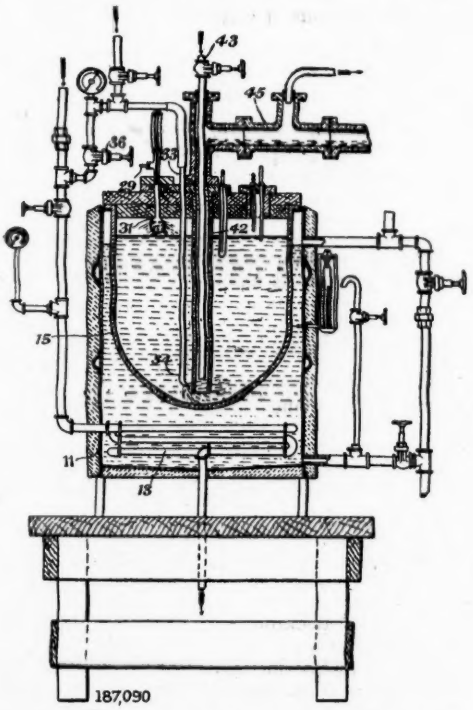
rotated at the same speed and in the same direction by spur gearing *g*. The upper end of the chamber *a* is partly surrounded by a jacket *l* which is heated externally by a burner *m*. Air is heated by drawing it through the jacket *l* and passing into the



chamber *a* through openings *p*. The ammonia gas is obtained from a fixed ammonia still, or in any other manner, and is introduced through a pipe *q* so that the mixture of air and ammonia passes through the chamber *a* to the outlet *r*. The sulphate of ammonia is dried and neutralised by its passage through the apparatus in the reverse direction.

187,090. CHEMICAL APPARATUS FOR PRECIPITATION PURPOSES. The British Thomson-Houston Co., Ltd., 83, Cannon Street, E.C.4. From the General Electric Co., Schenectady, N.Y., U.S.A. Application date, August 29, 1921.

The apparatus is particularly suitable for use in the production of tungstic oxide from a tungsten ore. The vessel 15 of stoneware is supported within the vessel 11, which is surrounded by heat insulating material. The vessel 11 preferably contains calcium chloride solution, from which the contents of the vessel 15 may be recovered in case of breakage of the



latter. The temperature of this solution is maintained at any desired point by a steam coil 13. A mixture of sodium tungstate and sodium nitrate solution is supplied through a pipe 29 which terminates in a sprayer 31. The hydrochloric acid for precipitating the tungsten is supplied through a similar pipe in the cover. To prevent settling of the precipitate, high-pressure air is supplied through a pipe 33, and steam may also be supplied through a valve 36, both being delivered through a nozzle 34 near the bottom of the vessel 15. The air or steam thus introduced and any gases generated are withdrawn from the vessel 15 by means of an ejector supplied with high-pressure air. The precipitate and solution are continuously withdrawn through an air-lift tube 42 extending nearly to the bottom of the vessel 15. The air supply pipe 43 is arranged concentrically within the pipe 42, and the liquid is discharged into a horizontal pipe 45 leading to the settling and washing tanks. The sodium tungstate and hydrochloric acid are supplied continuously to the vessel 15 in the proper proportions which are determined by venturi meters in the supply pipes.

187,051-2. ALCOHOL ETHER MIXTURES, MANUFACTURES OF. H. Wade, London. From F. E. Lichtenthaler, 173, Milk Street, Boston, Mass., U.S.A. Application date, July 27, 1921.

187,051. In the production of alcohol ether mixtures for motor fuel difficulties are usually experienced in condensing the ether vapour which is generated by the reaction of sulphuric acid and alcohol, owing to the low boiling point of ether, and this has involved the use of refrigerating machinery. In the present invention this is avoided by partly condensing the ether vapour by means of water and absorbing the uncondensed vapour in alcohol. The condensed ether is then added to the mixture.

187,052. Raw materials containing sugars or starches are fermented and the alcohol distilled off. Part of the alcohol vapour is converted into ether and the remainder condensed. The ether vapour is partly condensed and the uncondensed portion absorbed in the liquid alcohol. The condensed ether is then added to the ether alcohol mixture.

187,111. PURE NICKEL, MANUFACTURE OF. H. Sefton-Jones, London. From Soc. Anon. "Le Nickel," 26 Rue Lafitte, Paris. Application date, September 16, 1921.

The process is for treating impure oxides of nickel, such as those obtained from Canadian nickel and copper ores, to obtain pure nickel. The nickel oxide is powdered and mixed with a reducing agent such as powdered wood charcoal, and heated in a closed crucible or muffle so that the nickel oxide is partly reduced. The product is finely powdered and lixiviated with dilute hydrochloric and hydrofluoric acids to remove the greater part of the impurities and the residue is dried and agglomerated. The product is then calcined, and the presence of a small quantity of nickel oxide remaining after the initial partial reduction ensures the removal of any remaining carbon. Powdered charcoal and lime are also added to reduce and desulphurise the nickel in the later stages of calcination. Alternatively, the preliminary reduction may be complete instead of partial, but in this case the subsequent oxidising calcination must be such that the carbon in the agglomerated material is completely burnt out. The reducing agent may alternatively be coal, anthracite, retort carbon, mineral oil coke, wood, sawdust, wood-tar, resins, hydrogen or carbon monoxide. The lime may be replaced by calcium carbonate, magnesium carbonate, sodium carbonate or potassium carbonate for desulphurising the nickel.

187,129. OPTICALLY ACTIVE AROMATIC AMINO ALCOHOLS. O. Y. Imray, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, October 4, 1921.

Optically active aromatic amino alcohols are usually prepared by reducing the corresponding amino ketones in the form of their inactive salts, such as hydrochlorides or sulphates. These were converted into the free bases by the action of alkali and then into their tartrates for the purpose of separating the optical antipodes. The optically active amino alcohols were then obtained by the action of alkali. This process has the disadvantage that the amino alcohols are very sensitive towards alkaline reagents, and are twice exposed to the action of alkali. In the present invention, instead of reducing the inactive salts of the amino ketones, the active salts such as the bitartrates are reduced. A mixture of the optically active bitartrates of the amino alcohols is thus obtained, and these are separated and the free optically active bases are obtained by a single treatment with alkali. In an example, a mixture of methyl-amino-acetopyrocatechol and *d*-tartaric acid is treated with a colloidal solution of platinum and hydrogen until the

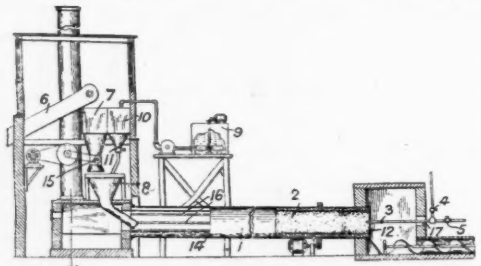
required amount of hydrogen is absorbed. The platinum is separated and the solution evaporated and filtered. The filtrate is evaporated to dryness and the residue dissolved in methyl alcohol. The *l*-ortho-dioxyphenyl-ethanol-methylamine tartrate may be crystallised out, dissolved in water, and treated with ammonia to precipitate the free *l*-ortho-dioxyphenyl-ethanol-methylamine. This corresponds with "adrenaline." The *d*-ortho-dioxyphenyl-ethanol-methylamine may be similarly obtained from its tartrate. The corresponding ethyl derivatives may be obtained in a similar manner.

NOTE.—Abstracts of the following specifications which are now accepted appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 166,888 (H. H. Smith), relating to treatment and concentration of ores, see Vol. V., p. 411; 169,185 (Farbwerke vorm. Meister Lucius and Bruning), relating to preparation of aliphatic dialkylaminoalkyl compounds, see Vol. V., p. 604; 173,230 (L. Lilienfeld), relating to manufacture of colloidally soluble substances and suspensions or emulsions, see Vol. VI., p. 250; 173,236 (Westinghouse Lamp Co.), relating to a process for the preparation of rare metals, see Vol. VI., p. 250; 173,502 (C. Clerc and A. Nihoul), relating to manufacture of magnesia from dolomite, see Vol. VI., p. 287; 179,934 (A. d'Ercole), relating to a process for the manufacture of fertilisers, see Vol. VII., p. 58.

International Specifications not yet Accepted

186,035. FERTILISERS. A. L. Kreiss, 23, Buckman Building, Jacksonville, Florida, U.S.A. International Convention date, September 13, 1921.

Phosphate rock is supplied by a conveyor 6 to a hopper 7, from which it passes by a valve 15 and hopper 8 to a rotary tube 1 which is slightly inclined and is lined with refractory material 12 at the discharge end 2. A tank 9 contains an alkaline solution, which may be sodium sulphate, sodium carbonate, potassium carbonate, a mixture of sodium and potassium sulphates, or a mixture of sodium carbonate, sodium



186,035

sulphate and potassium carbonate. This solution passes to a tank 10, and thence through a valve 11 to the hopper 8. A burner 3 at the discharge end of the tube is supplied with oil which is atomised by steam, and a reducing flame is projected into the tube. The phosphate is lifted by ribs 16 and dropped into the alkaline solution in which it breaks up. The mixture is clinkered in the reaction zone 2 and the product is discharged by a conveyor. The temperature within the tube is maintained at 500°-1000° C.

186,057. DYES. Durand et Huguenin, Soc. Anon., Basle, Switzerland. Assignees of M. Bader, 48, Boulevard du Maréchal Petain, Mulhouse, and C. Sunder, 9, Rue de Ferrette, Mulhouse, Alsace. International Convention date, September 16, 1921.

Reduction products of vat dyes (indigo, thioindigo, indanthrene, etc.) are subjected to the reaction of acids with their hydroxyl groups to produce enolic ethereal salts stable in air. In an example, dihydro-indigo is mixed with a pyridine solution of chlorsulphonic acid in an atmosphere of carbon dioxide. The mixture is diluted with water and crystallised to obtain the pyridine salt, which may then be converted into an alkali or other salt. These compounds may be used for printing or dyeing animal or vegetable fibres, and are subjected on the fibre to hydrolysis and oxidation. In examples, sulphuric acid derivatives of dihydro-indigo and dihydro-thioindigo are hydrolysed and oxidised simultaneously by ferric chloride, bromine, or chloride of lime.

LATEST NOTIFICATIONS.

188,296. Recovery of lac. Bhopal Produce Trust, Ltd. October 29, 1921.

188,311. Manufacture of lithopone. New Jersey Zinc Co. November 2, 1921.

188,335. Process of extracting sodaic salts contained in bicarbonated mineral waters. Appareils et Evaporateurs Kestner. November 5, 1921.

188,336. Process for the production of liquid fuel mixtures with alcohol as basis. Loriette, P. November 3, 1921.

188,338. Preparation of iron-free chromium compounds. Kinzlberger and Co. November 4, 1921.

188,344. Manufacture of starch. Singer, A. November 5, 1921.

Specifications Accepted, with Date of Application

167,752. Hydrochloric acid, Method of producing chemically pure. Rheinisch-Nassauische Bergwerks- and Hütten Akt. Ges. and G. Schuphans. August 2, 1921.

168,859. Carbonising bituminous substances such as coal or shale at low temperature, Apparatus for. Meguin Akt.-Ges. Butzbach and W. Müller. September 4, 1920.

170,572. Gases, Purification of. Koppers Co. October 22, 1920.

174,370–177,496. Crude phosphates, Process for rendering soluble. Rhenania Verein Chemischer Fabriken Akt.-Ges. and F. Rusberg. January 24 and March 23, 1921. 177,496 addition to 174,370.

181,313. Roasting pyrites, Mechanically operated furnaces for. Manufactures de Produits Chimiques du Nord Etablissements Kuhlmann. June 10, 1921. Addition to 167,464.

187,634. Chromium compounds, Manufacture of. C. K. Potter and F. Robinson. December 30, 1921.

187,639. Cellulose derivatives, Manufacture of. H. Dreyfus. April 19, 1921.

187,642. Centrifugal emulsifiers. W. P. Thompson (*Sharples Separator Co.*). April 27, 1921.

187,660. Soap, Process for the manufacture of. M. T. Khorassany. June 22, 1921.

187,729. Alloys of iron, Process for the manufacture of. F. Greiner. July 28, 1921.

187,732. Inks, water-colour paints, and like compositions. Plauson's (Parent Co.), Ltd. (*H. Plauson*). July 30, 1921.

187,810. Magnetic sand or finely divided iron ore, Process for the treatment of. A. Naito. September 29, 1921.

187,869. Ores and other materials, Method and apparatus for wet crushing. R. P. Whitelaw. November 24, 1921.

187,884. Grinding or crushing machines. G. Bamburg. December 13, 1921.

Applications for Patents

Beilby, G. T. Hydrogenation of hydrocarbon oils and residues. 30655. November 9.

Boberg, T., Spiers, H. M., and Techno Chemical Laboratories, Ltd. Treatment of starch-containing materials. 30916. November 11.

Carmichael and Co., Ltd., J. F., and Guillaume, F. J. Apparatus for manufacture of sulphuric acid. 30632. November 9.

Charity, W. H. C. D. Utilisation of waste lime from chemical works. 30407. November 7.

Chemische Fabrik Griesheim-Elektron. Production of stable compounds of calcium hypochlorite. 30593. November 8. (Germany, November 8, 1921.)

Coley, H. E. Reduction of ores, oxides, &c. 30772; 30775. November 10.

Coley, H. E. Gas manufacture. 30773. November 10.

Counsell Film Process and Chemical Co., Ltd. Treatment of photographic films. 30841. November 10. (Australia, November 22, 1921.)

Gare, T. Utilisation of rubber latex. 30874. November 11.

Henshaw, D. M., Holmes and Co., Ltd., W. C., and Whittell, J. Apparatus for bringing liquids and gases into intimate contact. 30346. November 7.

Imray, O. Y., and Soc. of Chemical Industry in Basle. Manufacture of azo-dyestuffs and chromium compounds thereof. 30923. November 11.

Jörgensen, P. Method of manufacturing a nitrogen-assimilating manure. 30569. November 8.

Kaye's Rubber Latex Process, Ltd. Manufacture of moulded or pressed goods from fibrous materials. 30434. November 7.

Lamplough, F. Treatment of hydrocarbon-bearing substances. 30746. November 10.

Lindsay, W. B., and Rideal, E. K. Elimination of sulphur from oil. 30837. November 10.

Singer, A. Manufacture of starch. 30337. November 6. (Austria, November 5, 1921.)

Staddon, D. R. Processes of manufacturing products from magnesium-containing substances. 30795. November 10.

Techno-Chemical Laboratories, Ltd., and Testrupp, N. Separating solids from liquids. 30700. November 9.

Ward Baking Co. Manufacture of yeast. 30815. November 10. (United States, March, 1922.)

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

LONDON, NOVEMBER 15, 1922.

THERE has been a fair volume of business passing on home trade account and certain products still maintain a firm tendency. Competition in some products has not been so much in evidence from the Continent, and with reductions in the English manufacturers' prices there is relatively not much difference between the two values.

The export position is more interesting on account of a greater volume of inquiries in the market, although the actual business passing is not large.

General Chemicals

ACETONE is as scarce as ever; the price is still higher, and there is only a very limited quantity offering for prompt delivery.

ACID ACETIC is in quite good demand with price firm.

ACID BORACIC has been reduced in price by the English manufacturers by £5 per ton for all grades.

ACID CITRIC is dull, with price still easier.

ACID FORMIC is in fair request, and the price is firmer on the week.

ACID OXALIC has been moderately called for, and the price is without change.

ACID TARTARIC is still dull.

ARSENIC is scarce for early delivery, and resale parcels are eagerly sought for.

BARIUM CHLORIDE is quiet and there has been no appreciable change.

BORAX (CRYSTALS) has been reduced by the English manufacturers by £1 per ton for all grades.

CREAM OF TARTAR has been in request for export, although the demand for home trade is rather slow.

FORMALDEHYDE is higher, with little offering on the spot, and there has been a fair amount of business transacted for forward.

LEAD ACETATE has been in fair request, and forward quotations from the Continent are higher.

LEAD NITRATE is dull, with no change in price.

POTASSIUM CARBONATE is easier, with the price in buyers' favour.

POTASSIUM PERMANGANATE is in good demand, and the price is inclined to harden.

SODIUM ACETATE is still very scarce for early delivery; a large number of inquiries have been on the market for delivery over the first quarter of next year.

SODIUM HYPOSULPHITE.—The commercial quality has been reduced in price by the English manufacturers, and the demand is steady.

SODIUM PRUSSIATE has been in request for delivery over the first half of next year.

ZINC OXIDE is firmer and has received a good inquiry.

Coal Tar Intermediates

THIS section has been slightly more interesting during the past week, both on home and export account.

ALPHA NAPHTHOL has been a feature in the export market.

ALPHA NAPHTHYLAMINE is unchanged.

ANILINE OIL.—Some fair inquiries have been received.

ANILINE SALT.—A small trade both on home and export account.

BENZIDINE BASE is firm, and orders have been placed for consumption in this country.

BETA NAPHTHOL is a small steady business.

DIANISIDINE continues difficult on home account.

DIMETHYLANILINE.—Some few orders have been placed.

DIPHENYLAMINE is firm at last quoted prices.

G. SALT is without special feature.

H. ACID is steady.

METAPHENYLENEDIAMINE continues to pass into consumption at last quoted price.

PARAPHENYLENEDIAMINE is unchanged.

R. SALT.—Some small home business is in the market.

RESORCIN continues in short supply at reasonable figures.

Coal Tar Products

THERE is little change in this market from last week.

90's BENZOL is firm at 1s. 9d. per gallon in the North, and 1s. 11d. to 2s. per gallon in London.

PURE BENZOL is still inactive, and is worth about 2s. per gallon in the North and 2s. 3d. to 2s. 4d. in London.

CREOSOTE OIL is slightly stronger than last week and the demand is well maintained. It is worth about 6¼d. to 6½d. per gallon in the North, and 7¼d. to 7⅜d. per gallon in the South.

CRESYLIC ACID has a poor market, and is worth about 2s. per gallon on rails for the Pale quality 97/99%, while the Dark 95/97% is worth about 1s. 10d. per gallon at works.

SOLVENT NAPHTHA is easy, and is worth about 1s. 8d. per gallon in the North and 1s. 10d. to 1s. 11d. per gallon in London.

HEAVY NAPHTHA has also a poor inquiry, and is worth about 1s. 6d. per gallon on rails.

NAPHTHALENE maintians its improved tone, and the crude qualities are worth from £7 to £8 per ton, while Hot Pressed is worth about £9 per ton.

PITCH.—The market continues to be very strong, and a further advance in prices has taken place. To-day's quotations are 126s. to 127s. 6d. f.o.b. East Coast and 130s. f.o.b. London. Buyers are not plentiful, but sellers are distinctly scarce.

Sulphate of Ammonia

THERE is no change in the position.

Current Prices

Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	1	8	to	0	1	10
Acetone oil	ton	80	0	0	to	82	10	0
Acetone, pure	ton	130	0	0	to	135	0	0
Acid, Acetic, glacial, 99–100%	ton	67	0	0	to	68	0	0
Acetic, 80% pure	ton	43	0	0	to	44	0	0
Arsenic, liquid, 2000 s.g.	ton	67	0	0	to	70	0	0
Boric, cryst.	ton	55	0	0	to	60	0	0
Carbolic, cryst. 39–40%	lb.	0	0	7	to	0	0	7½
Citric	lb.	0	1	9	to	0	1	10
Formic, 80%	ton	56	10	0	to	58	0	0
Gallic, pure	lb.	0	3	0	to	0	3	3
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	41	0	0	to	43	0	0
Lactic, 60 vol.	ton	43	0	0	to	44	0	0
Nitric, 80 Tw.	ton	27	0	0	to	29	0	0
Oxalic	lb.	0	0	7½	to	0	0	7½
Phosphoric, 1.5	ton	40	0	0	to	42	0	0
Pyrogallic, cryst.	lb.	0	5	9	to	0	6	0
Salicylic, Technical	lb.	0	1	0	to	0	1	2
Salicylic, B.P.	lb.	0	1	4	to	0	1	5
Sulphuric, 92–93%	ton	6	10	0	to	7	10	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	2½	to	0	1	3
Alum, lump	ton	10	0	0	to	10	10	0
Alum, chrome	ton	27	0	0	to	28	0	0
Alumino ferric	ton	9	0	0	to	9	5	0
Aluminium, sulphate, 14–15%	ton	10	10	0	to	11	0	0
Aluminium, sulphate, 17–18%	ton	11	10	0	to	12	0	0
Ammonia, anhydrous	lb.	0	1	6	to	0	1	8
Ammonia, .880	ton	33	0	0	to	35	0	0
Ammonia, .920	ton	21	0	0	to	23	0	0
Ammonia, carbonate	lb.	0	0	4	to	0	0	4½
Ammonia, chloride	ton	60	0	0	to	65	0	0
Ammonia, muriate (galvanisers)	ton	35	0	0	to	37	10	0
Ammonia, nitrate (pure)	ton	35	0	0	to	40	0	0

	Per	£	s.	d.		£	s.	d.
Ammonia, phosphate	ton	65	0	0	to	68	0	0
Ammonia, sulphocyanide	lb.	0	1	10	to	0	2	0
Amyl acetate	ton	175	0	0	to	185	0	0
Arsenic, white, powdered	ton	52	0	0	to	55	0	0
Barium, carbonate, 92–94%	ton	15	0	0	to	16	0	0
Barium, Chlorate	ton	65	0	0	to	70	0	0
Barium Chloride	ton	19	0	0	to	20	0	0
Nitrate	ton	27	10	0	to	30	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	1	0	to	0	1	3
Bleaching powder, 35–37%	ton	12	0	0	to	—		
Borax crystals	ton	28	0	0	to	32	0	0
Caffein	lb.	0	13	6	to	0	14	6
Calcium acetate, Brown	ton	10	10	0	to	11	10	0
,, ,, Grey	ton	15	10	0	to	16	0	0
Calcium Carbide	ton	16	0	0	to	17	0	0
Chloride	ton	6	0	0	to	—		
Carbon bisulphide	ton	50	0	0	to	52	0	0
Casein technical	ton	47	0	0	to	55	0	0
Cerium oxalate	lb.	0	4	6	to	0	4	9
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	2	to	0	1	3
Sulphate	ton	26	10	0	to	27	0	0
Cream Tartar, 98–100%	ton	100	0	0	to	102	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	77	10	0	to	80	0	0
Formusol (Rongalite)	lb.	0	2	6	to	0	2	9
Glauber salts, commercial	ton	5	0	0	to	5	10	0
Glycerine, crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	4	to	0	2	5
Iron perchloride	ton	30	0	0	to	32	0	0
Iron sulphate (Copperas)	ton	3	10	0	to	4	0	0
Lead acetate, white	ton	43	0	0	to	45	0	0
Carbonate (White Lead)	ton	42	0	0	to	47	0	0
Nitrate	ton	44	10	0	to	45	0	0
Litharge	ton	35	10	0	to	36	0	0
Lithopone, 30%	ton	23	10	0	to	24	0	0
Magnesium chloride	ton	5	10	0	to	6	0	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	7	10	0	to	8	0	0
Sulphate (Druggists')	ton	11	0	0	to	11	10	0
Manganese Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	60	0	0	to	62	0	0
Methyl acetone	ton	70	0	0	to	75	0	0
Alcohol, 1% acetone	ton	80	0	0	to	85	0	0
Nickel sulphate, single salt	ton	49	0	0	to	51	0	0
Ammonium sulphate, double salt	ton	51	0	0	to	52	0	0
Potash, Caustic	ton	32	0	0	to	33	0	0
Potassium bichromate	lb.	0	0	6	to	—		
Carbonate, 90%	ton	31	0	0	to	33	0	0
Chloride, 80%	ton	12	0	0	to	12	10	0
Chlorate	lb.	0	0	4½	to	0	0	5
Metabisulphite, 50–52%	ton	84	0	0	to	90	0	0
Nitrate, refined	ton	43	0	0	to	45	0	0
Permanganate	lb.	0	0	8½	to	0	0	9
Prussiate, red	lb.	0	4	6	to	0	4	9
Prussiate, yellow	lb.	0	1	6½	to	0	1	7½
Sulphate, 90%	ton	13	0	0	to	13	10	0
Salammoniac, firsts	cwt.	3	3	0	to	—		
Seconds	cwt.	3	0	0	to	—		
Sodium acetate	ton	24	10	0	to	24	15	0
Arseniate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	4¾	to	—		
Bisulphite 60–62%	ton	21	0	0	to	23	0	0
Chlorate	lb.	0	0	3½	to	0	0	4
Caustic, 70%	ton	20	10	0	to	21	0	0
Caustic, 76%	ton	21	10	0	to	22	10	0
Hydrosulphite, powder, 85%	lb.	0	1	9	to	0	2	0
Hyposulphite, commercial	ton	11	0	0	to	12	0	0
Nitrite, 96–98%	ton	29	10	0	to	30	0	0
Phosphate, crystal	ton	16	0	0	to	16	10	0
Perborate	lb.	0	0	11	to	0	1	0
Prussiate	lb.	0	0	11½	to	0	1	0
Sulphide, crystals	ton	12	0	0	to	12	10	0
Sulphide, solid, 60–62%	ton	20	10	0	to	22	10	0
Sulphite, cryst.	ton	12	10	0	to	13	0	0
Strontium carbonate	ton	55	0	0	to	60	0	0
Strontium Nitrate	ton	40	0	0	to	42	0	0
Strontium Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Sulphur, Flowers	ton	11	0	0	to	12	0	0
Roll	ton	11	0	0	to	12	0	0

	Per	£	s.	d.		£	s.	d.
Tartar emetic	lb.	0	1	3	to	0	1	4
Theobromine	lb.	0	12	6	to	0	13	0
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	5	to	0	1	6
Zinc chloride 102° Tw.	ton	21	0	0	to	22	10	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	37	0	0	to	38	0	0
Dust, 90%	ton	45	0	0	to	47	10	0
Sulphate	ton	16	10	0	to	17	10	0

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	2	3	to	0	2	6
Alphanaphthol, refined	lb.	0	3	0	to	0	3	3
Alphanaphthylamine	lb.	0	2	0	to	0	2	1
Aniline oil, drums extra	lb.	0	0	10	to	0	0	11
Aniline salts	lb.	0	0	11	to	0	1	0
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	3	6	to	0	4	0
Benzidine, base	lb.	0	5	0	to	0	5	3
Benzidine, sulphate	lb.	0	5	0	to	0	5	3
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzoate of soda	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	5	0	to	0	5	3
Betanaphthol	lb.	0	1	4	to	0	1	4½
Betanaphthylamine, technical	lb.	0	5	0	to	0	5	6
Croceine Acid, 100% basis	lb.	0	3	6	to	0	3	9
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	2	9	to	0	3	0
Dinitrobenzol	lb.	0	1	3	to	0	1	4
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	5	to	0	1	6
Dinitrophenol	lb.	0	1	9	to	0	2	0
Dimethylaniline	lb.	0	2	6	to	0	2	9
Diphenylamine	lb.	0	4	3	to	0	4	6
H-Acid	lb.	0	6	0	to	0	6	3
Metaphenylenediamine	lb.	0	4	9	to	0	5	3
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	6	0	to	0	6	6½
Metatoluylenediamine	lb.	0	4	6	to	0	4	9
Monosulphonic Acid (2.7)	lb.	0	5	6	to	0	6	0
Naphthionic acid, crude	lb.	0	2	9	to	0	3	0
Naphthionate of Soda	lb.	0	3	0	to	0	3	3
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Neville Winther Acid	lb.	0	7	9	to	0	8	0
Nitrobenzol	lb.	0	0	9	to	0	0	9½
Nitronaphthalene	lb.	0	1	2	to	0	1	3
Nitrotoluol	lb.	0	1	0	to	0	1	2
Orthoamidophenol, base	lb.	0	12	0	to	0	12	6
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	1	6	to	0	1	9
Orthonitrotoluol	lb.	0	0	8	to	0	0	10
Para-amidophenol, base	lb.	0	9	0	to	0	9	6
Para-amidophenol, hydrochlor	lb.	0	8	6	to	0	9	0
Paradichlorbenzol	lb.	0	0	6	to	0	0	7
Paranitraniline	lb.	0	3	6	to	0	3	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	5	0	to	0	5	3
Paraphenylenediamine, distilled	lb.	0	10	6	to	0	10	9
Paratoluidine	lb.	0	6	0	to	0	6	6
Phthalic anhydride	lb.	0	2	9	to	0	3	0
Resorcin, technical	lb.	0	4	6	to	0	5	0
Resorcin, pure	lb.	0	6	3	to	0	6	6
Salol	lb.	0	2	0	to	0	2	3
Sulphanilic acid, crude	lb.	0	1	0	to	0	1	1
Tolidine, base	lb.	0	6	6	to	0	7	0
Tolidine, mixture	lb.	0	2	6	to	0	2	9

French Potash

THE weekly market report issued by the Agricultural Information Bureau for the French Potash Mines states that the present Agricultural depression is, to some extent, reflecting on the potash fertiliser trade. The demand for the more concentrated muriate and sulphate is steady, but buyers seem more in favour of the less concentrated grades, and Kainit 14 per cent. and Sylvinite 20 per cent. and 30 per cent. are in good demand, as the prices at which they can be offered are more in keeping with the necessity to the farmer of decreased costs of production. Merchants are buying largely the cheaper, less concentrated grades, and a considerable business is being done with Kainit 14 per cent.

There is an increasing all-round demand for potash fertilisers.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

GLASGOW, November 15th, 1922.

DURING the past week inquiries have been numerous, but the amount of business put through left much to be desired.

Makers advise reductions in the prices of boric acid and borax of £5 per ton and £1 per ton respectively. English red lead has advanced £1 per ton.

Continental prices are inclined to be higher.

Industrial Chemicals

ACID ACETIC.—Glacial, 98/100%, some parcels offered at £54 per ton, c.i.f. U.K.; 80% pure, £43 to £44 per ton; 80% technical £39 to £40 per ton.

ACID BORACIC.—Makers reduced price by £5 per ton; crystal or granulated now £55 per ton; powdered, £57 per ton, carriage paid U.K.

ACID CARBOLIC.—Ice crystals in fair demand and price higher at 8d. to 8½d. per lb.

ACID FORMIC, 85%.—Offered at £57 10s. per ton.

ACID HYDROCHLORIC.—Makers' price unchanged, 6s. 6d. per carboy, ex works.

ACID NITRIC, 84°.—Moderate inquiry for export. Price for home consumption packed in carboys, £27 10s. per ton.

ACID OXALIC, 98/100%.—Offered at 7¼d. per lb., delivered.

ACID SULPHURIC.—Price unchanged; 144°, £4 per ton; 168°, £7 5s. per ton; de-arsenicated, £1 per ton more.

ACID TARTARIC.—Offered for prompt delivery at 1s. 2d. per lb. ex wharf.

ALUM LUMP POTASH.—Spot lots on offer at £13 per ton ex store.

ALUMINA SULPHATE.—English material, 14/15%, about £10 15s. per ton; 17/18%, £1 per ton more.

AMMONIA CARBONATE.—Unchanged; lump, 4d. per lb.; ground, 4¼d. per lb., delivered.

AMMONIA LIQUID.—880°, quoted 3½d. per lb.; 940°, 1¾d. per lb., ex works.

AMMONIA MURIATE.—Grey galvanisers quality offered at £32 per ton, f.o.r. works.

AMMONIA SULPHATE.—25¼%, £15 per ton; 25¾%, neutral, £16 3s. per ton, ex works. November/December.

ARSENIC, WHITE POWDER.—Buyers apparently holding off meantime. Price about £53 per ton.

BARIUM CHLORIDE, 98/100%.—Offered from Continent at £18 10s. per ton, c.i.f., prompt.

BARYTES.—English makers' price unchanged; £5 5s. per ton, ex works, for finest white.

BLEACHING POWDER.—Price unchanged, £12 15s. per ton, ex station, spot deliverty.

BORAX.—Price reduced £1 per ton. Crystal or granulated £28 per ton; powdered, £29 per ton carriage paid U.K. station.

CALCIUM CHLORIDE.—English makers' price £6 per ton, ex quay. Offered from Continent at £3 17s. 6d. per ton, c.i.f. U.K.

COPPER SULPHATE.—In little demand. Offered at £26 per ton, ex quay.

COPPERAS, GREEN.—Price £3 10s. to £3 15s. per ton.

FORMALDEHYDE, 40%.—Inclined to be scarce, and prices higher at £78 to £79 per ton.

GLAUBER SALTS.—Quoted at £4 to £4 10s. per ton, ex store, according to quality.

GLYCERIN.—1260 B.P. quality £82 10s. per ton, ex store.

LEAD.—Red advanced to £38 15s. per ton; white, £50 15s. per ton. Both delivered ex station in 5-ton lots. Continental red lead, £34 per ton, ex store.

MAGNESITE.—Ground calcined £7 to £10 per ton, ex store, according to quality.

MAGNESIUM CHLORIDE.—Offered from Continent at £3 15s. per ton, c.i.f. U.K.

MAGNESIUM SULPHATE (EPSOM SALTS).—Unchanged; commercial, £7 5s. per ton; B.P. £9 per ton. Continental offers of Commercial offered at £5 15s. per ton, ex store.

POTASSIUM BICHROMATE.—English makers' price, 6d. per lb. delivered

POTASSIUM CARBONATE, 88/92%.—Spot lots offered at £28 per ton, ex store; 96/98%, about £30 per ton, c.i.f.

POTASSIUM CAUSTIC, 88/92%.—In moderate request. Price £29 per ton spot delivery.

POTASSIUM CHLORATE.—Crystal or powdered offered at 3½d. per lb., ex store.

POTASSIUM MURIATE.—Moderate export inquiry. Quoted £10 per ton f.o.b., basis 80%.

POTASSIUM PERMANGANATE.—Commercial crystals, 7½d. per lb. Pure crystals at 8d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot parcels offered at 1s. 6d. per lb., ex station.

POTASSIUM SULPHATE, 90%.—Offered at £13 10s. per ton, c.i.f. U.K.

SODIUM ACETATE.—Price about £23 10s. per ton, ex station.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay; m.w. quality £1 less.

SODIUM BICHROMATE.—English makers' price, 4½d. per lb. delivered.

SODIUM CARBONATE.—Soda crystals, £5 10s. to £5 15s. per ton, ex quay or station; alkali, 58%, £9 2s. 6d. per ton, ex quay or station.

SODIUM CAUSTIC.—76/77%, £23 5s. per ton; 70/72%, £21 5s. per ton; 60/62%, £20 5s. per ton; 98/99%, powdered, 26 15s. to £27 15s. per ton, ex station; caustic bottoms, £11 per ton, ex store.

SODIUM HYPOSULPHITE.—Commercial quality, £11 to £11 10s. per ton; pea crystals, £17 per ton, ex station.

SODIUM NITRATE.—96/98%, refined quality quoted £12 10s. per ton, free-on-rails.

SODIUM PRUSSIATE (YELLOW).—Inclined to be dearer at 11¾d. to 1s. per lb., ex station.

SODIUM SILICATE 140°.—English material, £12 5s. per ton, ex station.

SODIUM SULPHATE (SALTCAKE 95%).—Price for home consumption, £4 per ton, delivered. Good inquiry for export, but supplies scarce.

SODIUM SULPHIDE, 60/62% conc. offered at £15 per ton, c.i.f.; 30/32% crystals, £8 per ton, c.i.f. U.K.

SULPHUR.—Government surplus stocks of Sicilian thirds still available at £3 10s. to £3 15s. per ton, ex depot. Flowers, £11 per ton; rock, £9 per ton; roll, £10 per ton; ground, £9 per ton. In little demand. Prices nominal.

TIN CRYSTALS.—Price remains unchanged, 1s. 2d. per lb.

ZINC CHLORIDE.—98/100%, offered from Continent at £20 per ton, c.i.f. U.K.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHYLAMINE.—Home makers offer at 1s. 9d. to 1s. 9½d. lb.

ANTHRACENE.—40% to 50% is offered at 4½d. per unit, delivered; pure is offered at 11d. per lb., delivered.

BENZOL, CRUDE.—Supplies are being freely offered for delivery during the first three or six months of 1923, and the market inclines to be weaker. Motor benzol is also being freely offered.

BETA OXY NAPHTHOIC ACID.—Home inquiry. Price quoted, 11s. per lb., delivered.

PARA AMIDO PHENOL HYDROCHLORIDE.—Home inquiry. Price quoted, 8s. 7d. per lb., on 100% basis, delivered.

PARANITRANILINE.—Remains firm. Price from 3s. to 3s. 1d. per lb. delivered.

British Dyes in the U.S.A.

ACCORDING to statistics issued by the U.S.A. Department of Commerce showing the imports of dyes into the United States during July last, 42,564 lb. of alizarine and alizarine dyes were imported, the United Kingdom share being 2,774 lb., while Germany supplied 32,928 lb. Of the total of 164,468 lb. of dyes not elsewhere specified, we furnished 9,854 lb., Switzerland was the largest supplier, with 77,450 lb., and Germany came next with 64,401 lb.

The Manchester Chemical Market

[FROM OUR OWN CORRESPONDENT.]

Manchester, November 16.

CHEMICAL traders here are not enthusiastic regarding the position this week, a rather dull feeling having pervaded the whole market. With the election out of the way, however, there are hopes of business on a larger scale being put through in the near future. The home demand is fairly good, but only for a restricted range of products. A number of foreign inquiries are coming in, but up to the present they have not led to much increased business, export shipments as before being confined chiefly to the Colonial markets. Prices this week in some lines have shown an easier tendency.

Heavy Chemicals

The home trade demand for caustic soda is still rather subdued, with, however, a fairly good business being put through on Colonial account; home delivery prices are £20 per ton for 70 per cent. strength, and £22 for 76 per cent. Soda crystals are rather firm and in moderate inquiry at £5 12s. per ton delivered. Bleaching powder is quiet but steady at £12 to £12 10s. per ton, in softwood casks. Saltcake is firm and in good demand for prompt shipment; the price is unchanged at about £4 per ton. Sodium sulphide keeps quiet but firm at £17 10s. for 60–65 per cent. concentrated, and £11 per ton for crystals. Ammonia alkali is quiet and easier, £7 17s. 6d. per ton now being asked for 58 per cent. material. Bicarbonate of soda keeps very steady at £10 10s. per ton, in 2 cwt. bags, carriage paid. Hyposulphite of soda is quieter, but prices are maintained at last week's level of £18 10s. for photographic crystals, and £10 10s. per ton for commercial. Glauber salts are firm and in moderate inquiry at £4 10s. per ton. Nitrite of soda is not too active but the price keeps steady at about £28 per ton. Phosphate of soda is rather neglected and is lower on the week at about £15 per ton. Prussiate of soda is again easier at about 10¾d. per lb., but neither prompt nor forward supplies are excessive. Chlorate of soda is offered freely at 2¾d. to 3d. per lb. Bichromate of soda is in fair demand at the new contract price of 4½d. per lb., delivered. Business in acetate of soda has improved a little, and the price is firm at £23 per ton.

Caustic potash is easier at about £28 per ton for 88–90 per cent. strength. Bichromate of potash is steady at 6d. per lb. Yellow prussiate of potash is scarce and in moderate inquiry at 1s. 6d. per lb., with red firm at about 4s. 3d. Carbonate of potash is still in rather good demand at £29 per ton for 96–98 per cent. material. Chlorate of potash is quiet and is now quoted at 3¾d. per lb. Permanganate of potash in quietly steady demand at 7½d. per lb.

Sulphate of copper shows little improvement, and prices are still round £26 to £27 per ton. The demand for arsenic keeps up, and with spot supplies scarce white powdered, Cornish makes, have further advanced to £54 per ton. Commercial Epsom salts meet with only a very moderate inquiry at about £5 £5s. per ton. Acetate of lime continues scarce for spot delivery, and £15 10s. is now asked for grey, with brown unchanged at £8 5s. per ton. Nitrate of lead is quiet at £42 to £43 per ton. White sugar of lead is maintained at £38 and brown £34 per ton without, however, very much business passing. Ammonium muriate is firm at about £35 for grey and £40 per ton for white. Alum attracts little attention, and lump is still quoted at about £13 per ton.

Acids and Tar Products

Tartaric and citric acids show no improvement, and with offers on the heavy side prices are easier at 1s. 2d. for tartaric and 1s. 9d. per lb. for citric B.P. quality. Acetic acid is very firm and meets with a steady demand; glacial is quoted at £65 and 80 per cent. technical at £40 per ton. Oxalic acid is quiet at 7d. per lb. Crystallised boracic acid has now been reduced to £55 per ton.

The export demand for pitch keeps up and the price is rapidly advancing, £6 to £6 5s. per ton, f.o.b. Manchester, now being heard of. Carbolic acid crystals are quiet but unchanged at 6½d. to 6¾d. per lb. Crude carbolic acid is quoted at 2s. to 2s. 3d. per gallon for 60 per cent. material. Benzol is rather dull and weaker at about 1s. 8d. per gallon. Solvent naphtha is in fair demand at 1s. 9d. to 1s. 10d. per gallon for 90–160. Creosote oil is firmer at 6½d. to 6¾d. per gallon. Crude naphthalene is very firm at up to £7 per ton, with flake quoted at £17, and crystals £15 per ton.

The Nitrate Market

Proposed German Imports in 1923

HENRY BATH AND SON, LTD., in their monthly report on nitrate of soda, dated October 31, state that deliveries from European ports during October amounted to about 43,000 tons, compared with 21,000 tons in October last year.

Continental markets have remained exceedingly quiet throughout the month, and currency prices have risen steadily under the influence of the depreciating franc and lira. In the prevailing circumstances the purchase of nitrate in those markets has resolved itself into a speculation in exchange, and it is unlikely that there will be any appreciable volume of anticipatory buying by consumers until more stability in exchanges is evidenced. The sterling value of nitrate for spot delivery is approximately £11 12s. 6d. to £11 17s. 6d. and for spring delivery £12 5s. to £12 10s. per ton.

With delivery markets so inactive there have been few transactions in cargoes, though the provisionment of outports has proceeded satisfactorily. An October liner parcel was reported sold at £11 15s., c.i.f., which remains the nearest value at the close. In spite of the dullness in consuming markets, there is very little pressure to sell floating nitrate, holders being encouraged, no doubt, by the fact that the lowest cost of arranging fresh supplies from Chile is £12, c.i.f., basis Dunkirk/Hamburg range.

Producers' Sales

Sales of nitrate, f.a.s. Chile, during October by the Nitrate Producers' Association amounted to about 48,000 tons, bringing the total association sales for delivery during the current nitrate year to nearly 950,000 tons. Excluding any quantity which may be imported into Germany, it is estimated that something like two-thirds of the world's expected consumption of nitrate of soda up to the end of June next have already been provided for, so that further purchases of importance from the association are likely to be deferred until actual consumers take a larger interest than at present.

German synthetic nitrate of soda is now quoted 576.10m. per unit of nitrogen per 100 kilos., which, based upon exchange of 20,000m., is the parity of about £4 12s. per ton for Chilean nitrate.

The question of Germany importing considerable quantities of Chilean nitrate next spring is the subject of much discussion in that country, and agriculturists there are understood to have expressed their opinion of the undoubted necessity of supplies being provided. The greatest difficulty, however, exists in reconciling the requirements of agriculture with the exigencies of Germany's financial position; but it appears still to be hoped that a means will be found for importing fairly considerable quantities into Germany during next spring.

Freights have ruled steady at about 30s. for December/January liner space, while a November steamer obtained 132s. for the Bordeaux/Hamburg range.

Cerium as a Steel Alloy

THE study of cerium as an alloying element in steel, conducted at the Ithaca, N.Y., field station of the United States Bureau of Mines, in co-operation with the Welsbach Co., has been concluded. The attempt to utilise the cerium group of metals, made from by-products of the gas mantle industry, in alloys other than the pyrophoric alloys, gave only negative results. In aluminium alloys the cerium group of metals had no useful effect either as alloying materials or as scavengers. In steel, the desulphurisation effected by the cerium metals was accompanied by the retention in the steel of inclusions due to the cerium metals. The harmful effect of the inclusions over-balanced any good effect due to desulphurisation or to the presence of cerium metals as alloying elements. Neither plain carbon steel nor various alloy steels to which cerium was added were improved; usually, especially when heat-treated, they were decidedly poorer than similar steels without cerium. Collected data showed cerium to have no marked effect as a true alloying element in steel, and to be harmful rather than helpful when used as a scavenger. The conclusion drawn was that, under any condition tried, the cerium group of metals was not useful either in steel or in aluminium, and such data as were available indicated that it would not be useful in other non-ferrous alloys.

Company News

JOHN BELL AND CROYDEN, LTD.—The transfer books of the 7 per cent. first mortgage debenture stock are closed until November 30.

FULLERS' EARTH UNION. An interim dividend at the rate of 10 per cent. per annum, less tax, was payable on Thursday on the ordinary shares in respect of the half-year.

SWEDISH MATCH FACTORIES, LTD.—It is announced that the directors have decided to increase the share capital by 45,000,000 kroner, thus bringing it up to 90,000,000 kroner.

"SANITAS" CO.—Payable on December 1, an interim dividend at the rate of 9 per cent. per annum has been declared on the preference shares. The transfer books are closed until November 29.

LAGUNAS SYNDICATE.—The accounts for the year ended June 30 show a net profit of £21,689. This sum has been transferred to the sinking fund, which is thereby increased to £343,345. The company's oficina, South Lagunas, was re-opened at the beginning of last August.

LASTENIA NITRATE CO.—We are informed that the lists in connection with the offer for sale of £1,000,000 6½ per cent. first mortgage debenture stock of the Lastenia Nitrate Co. (Compania Salitrera Lastenia) at 95½ were closed on November 9. Applications received by post on November 10 received consideration.

PHŒNIX CHEMICAL CO.—An extraordinary general meeting was called for Thursday, to be followed by another on December 1 to consider a resolution for reducing the capital from £150,000 to £125,000 by cancelling as lost 10s. of each of the 50,000 ordinary shares of £1 each and by reducing the nominal amount of such shares to 10s. each.

CLEVELAND SALT CO.—With £1,026 brought in and the net profit for the year to September 30 last, £5,598, there is an available sum of £6,624. A dividend of 15 per cent. and a bonus of 15 per cent. on both the preferred and deferred shares is declared, and £1,225 is to be carried forward. The annual meeting will be held on November 29.

BURMA CORPORATION.—A surplus of Rs. 74,67,103 (equal to £497,807 at exchange of 1s. 4d.), after charging all operating expenditure, is recorded in the accounts for the year 1921. Of the above surplus, after providing for interest, depreciation, income and supertaxes, and placing to reserve of Rs.105 lakhs, there remains Rs.25,11,485 (£167,432), which it is proposed to carry forward.

BELL'S UNITED ASBESTOS CO., LTD.—It was notified that as the issue of £100,000 5½ per cent. first debentures has been considerably over-subscribed, applications from shareholders could not be accepted after Tuesday, but applications from holders of 5 per cent. debentures who wished to exchange them for the new issue would be accepted up to the first post to-day (Saturday).

W. H. DORMAN AND CO., LTD.—The accounts for the year ended July last show, after crediting £28,676 from the taxation recovery account and providing for interest on the 8 per cent. participating seven-year notes, a credit balance of £10 to carry forward; £30,000 is required for working capital; and it is proposed to create £150,000 10 per cent. second debentures and offer £80,000 of these to the shareholders.

LIVERPOOL NITRATE CO.—A loss of £79,550 is shown in the report for the year to June 3 last; this, with the dividend paid in November last year, reduces the profit and loss balance to £17,221, which is carried forward. It is proposed to increase the capital to £700,000 by creating 2,400,000 5s. shares, and to distribute 876,825 shares in the proportion of three new for each old share; also to consolidate every four shares of 5s. into one share of £1. The authorised capital is now £100,000 in shares of 5s. each, of which £73 068 15s. has been issued and called up. Recent dividends have been:—For 1910–11, 75 per cent.; for 1911-12, 125; for 1912-13, 150; for 1913-14, 100; for 1914-15, 80; for 1915-16, 100; for 1916-17, 120; for 1917-18, 1918-19, and 1919-20, 140 each time; and for 1920-21, 100 per cent.

SANTA CATALINA NITRATE CO.—A gross profit of £6,616 is shown in the accounts for the year to June 30 last. From this have to be deducted London expenses, £2,226, leaving £4,390, and £4,691 was brought in, which, with £5,000 re-transferred from reserve, makes a total of £14,081. After charging stoppage of works expenses, £5,459, and deducting the interim dividend of 5 per cent. paid in June last, £3,950, there remains £4,072. The directors propose a further dividend of 5 per cent. (1s. per share), £3,960, carrying forward £722. Profit has been taken in the accounts on 43,596 quintals of nitrate sold, against 143,243 quintals in the previous year. The manufacture of nitrate has been suspended throughout the year. The annual meeting will be held at Winchester House, London, E.C., on November 20, at noon.

WEARDALE LEAD CO.—Including income from investments, etc., the profit for the year is £12,297. After making the necessary deductions there remains a credit balance of £8,760. Being unable to advise payment free of tax on this occasion, the directors recommend a dividend of 6 per cent. less tax, leaving £2,885 to be carried forward. About £10,000 worth of investments have been sold at a figure substantially above "written down" value to finance the cost of an aerial ropeway between Rookhope and Eastgate Station as well as a railway siding at the latter point. This project, contemplated for some time past, is now urgently necessary, and should be revenue-producing compared with the rates hitherto paid to a private company. The ropeway and siding are expected to be available for use early next month. The annual meeting will be held at the Central Station Hotel, Newcastle-on-Tyne, on November 22, at noon.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OR FIRM OR AGENT.	MATERIAL.	REF. No.
Netherlands ..	Wood-alcohol and pyridine bases.	D.O.T. 17422/ F.W./C.P.
Buenos Aires..	Druggists' sundries.	559
Barcelona.....	Fine and pharmaceutical chemicals and heavy chemicals for bleaching, dyeing, etc.	538
Barcelona.....	Dyes, colours and drugs.	541

Tariff Changes

BELGIUM.—It is rumoured that the whole of the Customs tariff now in force may be revised to suit the change that has taken place during the past few years in Belgian foreign trade.

RUMANIA.—As from October 20 last exporters of manganese are obliged to place one-third of the metal intended for exportation at the disposal of the Ministry of Commerce. This quantity will be paid for at the rate of one lei per kilo. The exporter, when applying for the export permit, is obliged to deposit 10,000 lei per wagon with the Ministry, which reserves the right to dispose of the corresponding quantity of manganese within three months from the date of issuing the permit. Should the manganese not be required, the money is refunded, while, should it be required, the exporter receives back the 15,000 lei and the price of the manganese.

UNITED STATES OF AMERICA.—The American Government announces a tariff of 8 per cent. on Canadian cement. A similar duty is provided for in the Canadian tariff list on American cement, hitherto free under a reciprocal clause.

PERU.—Under the proposed new tariff now before the Peruvian Congress, and which may become law on January 1 next, heavy chemicals are subject to higher duties.

Contracts Open

Tenders are invited for the following articles. The latest dates for receiving tenders are, when available, given in parentheses:

HOLLAND (December 1).—Wood alcohol (150,000 kilos); pyridine bases (1,500 kilos). Particulars from Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. (Reference No. 17422/F.W./C.P.). Tenders to the Directeur van het Laboratorium van het Departement van Financien, Amsterdam.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

PULPHER, Mr. P. J., 45, Stevens Road, Tunbridge Wells, chemist. (C.C., 18/11/22.) £18 13s. 4d. October 5th.

NEVILLES (PARIS), LTD., registered office, North Wharf, Gordon Road, West Ealing, perfume merchants. (C.C., 18/11/22.) £12 10s. October 10th.

WILSON, Mr. S., Burnham Market, chemist. (C.C., 18/11/22.) £17 1s. 9d. October 5th.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

Satisfactions

BENZOL AND BY-PRODUCTS, LTD., London, S.W.—(M.S., 11/11/22.) Satisfaction registered October 25, £40,000, registered July 7, 1920.

SUTCLIFFE AND BINGHAM, LTD., Manchester, manufacturers of chemists' specialities. (M.S., 11/11/22.) Satisfaction registered October 25, all moneys, etc., registered July 29, and September 7, 1921.

London Gazette

Companies Winding-Up Voluntarily

THE BARKERSHAW CHEMICAL CO., LTD., Bradford. (C.W.U.V., 18/11/22.) J. W. Reynolds, 23, Bank Street, Bradford, appointed liquidator.

CARBON PRODUCTS AND OIL DISTILLATION, LTD. (C.W.U.V., 18/11/22.) L. C. Walker, Finsbury Pavement House, London, E.C.2, appointed liquidator. Meeting of creditors, Finsbury Pavement House, London, E.C.2, on November 23rd, 1922, at 12 o'clock noon.

Notices of Intended Dividends

SEDDON, Percy, 32, Rochdale Road East, and 30, Bridge Street, Heywood, Lancaster, chemist. Last day for receiving proofs, November 25th. Trustee, A. T. Eaves, 15, Fountain Street, Manchester.

ROBINSON, Wilson, ROBINSON, Tom, and WIGHTMAN, James, carrying on business together in co-partnership under the style of WILSON ROBINSON AND SON, dyers, Albion Dyeworks, Batley Carr, Batley, York. Last day for receiving proofs, November 25th. Trustee, W. Durrance, Official Receiver, 12, Duke Street, Bradford.

Partnership Dissolved

STREET AND CO., (EMERSON, James Peter; ISHERWOOD Harry; and FORD, Walter); Cross Lane, Radcliffe, Lancaster, drug store proprietors, by mutual consent as from September 30, 1922. Debts received and paid by W. Ford, who will continue the business.

New Companies Registered

J. AUSTIN BAYES, LTD., manufacturing, wholesale, retail, and analytical chemists and druggists, etc. Nominal capital, £3,000 in £1 shares. A director: J. A. Bayes, 25, Clifton Road, Rugby.

DAVID CHINKIN PHARMACIES, LTD., chemists, druggists, drysalters, oil and colourmen, etc. Nominal capital, £500 in £1 shares. A director: D. Chinkin, 26, Fieldgate Street, E.1.

GRANASTIK, LTD. To erect refining works for the production of sulphuric acid and other chemicals, etc. Nominal capital, £10,500 in 10,000 "A" ordinary shares of £1 each, and 10,000 "B" ordinary shares of 1s. each. Secretary: G. T. Lupson, 16a, Highland Road, Upper Norwood, S.E.

JACKSONS (WALKDEN), LTD., 160, Bolton Road, Walkden, Lancs. Manufacturers of and dealers in chemical preparations, oils, paints, pigments and varnishes, chemical and scientific apparatus, etc. Nominal capital, £700 in £1 shares.

MAGIC OIL CO., LTD., Whitesides Yard, Albans Road, St. Annes-on-Sea. Manufacturers and importers of chemicals, refiners, suppliers and distributors of vegetable oils and animal fats, etc. Nominal capital, £5,000 in £1 shares.

READ'S PHARMACY, LTD., 21, Magdalen Road, Norwich. Chemists, druggists, opticians; dealers in surgical and scientific instruments, etc. Nominal capital, £400 in £1 shares.

J. SHERMAN AND CO., LTD., 1, Chesnut Road, Tottenham, N.17. Manufacturing chemists and refiners of oils, fats and greases of all kinds, etc. Nominal capital, £2,000 in £1 shares (1,000 5 per cent. cumulative preference).

J. W. STEVENS, LTD., 23, Holborn Hall, Grays Inn Road, W.C.1. Manufacturers of and dealers in edible and technical fat, tallow, and other animal products, etc. Nominal capital, £4,750 in 25,000 ordinary shares of 1s. each, and 3,500 preference shares of £1 each.

TURNER'S CARBIDES, LTD. Manufacturers of and dealers in carbide, oils and acetylene gas plant; manufacturing chemists and druggists. Nominal capital, £15,000 in £1 shares. A director: P. Turner, 26, Sunny Bank, Hull.

UNI-COAL SYNDICATE, LTD., 54, Gresham Street, E.C. Dealers in oil, shale, lignite or peat deposits, etc. Nominal capital, £5,000 in £1 shares.

WALWORTH PHARMACY, LTD., 283, Walworth Road, London, S.E.17. Chemists, druggists, drysalters, oil and colour merchants, etc. Nominal capital, £500 in £1 shares.

WESTERN CHEMICAL CO. (PAISLEY), LTD., Sandyford Works, Paisley. Manufacturers of all classes of chemicals Nominal capital, £150,000 in £1 shares.

WOODS AND WEBB, LTD., 80, Gray's Inn Road, W.C.2. Chemists, druggists, drysalters, oil and colour merchants, etc. Nominal capital, £500 in £1 shares.

Patents Court Cases

APPLICATIONS have been made for the following patents to be indorsed "Licences of Right" under Sect. 24 of the Patents and Designs Acts, 1907 and 1919:—9609/1911 and 2002/1913 relating to the manufacture of ammonium sulphate, and 103,696 relating to the manufacture of chromates, all in the name of G. N. Vis; 109,814 relating to the manufacture of sodium carbonate and ammonium sulphate from sodium bisulphate, 119,219 relating to the conversion of sodium monochromate into bichromate, 119,647 and 138,111 relating to purifying alkali chromates, 122,172 relating to transforming alkaline monochromates into bichromates, 127,549 and 136,834 relating to recovery of ammonia from coke-oven gases, 131,289 relating to converting sodium monochromate into bichromate or chromic acid, 136,833 relating to recovering ammonium and sodium sulphate from coke-oven gases by using sodium bisulphate, 128,895 and 158,282 relating to the separation of double sodium-ammonium sulphate into sodium sulphate and ammonium sulphate, all in the name of Soc. Industrielle de Produits Chimiques; 156,713 relating to the manufacture of perborates and di-sodium perphosphates, in the name of S. Aschkenasi. These applications, if granted, will enable any person to obtain licences under the above patents upon terms to be settled by the Comptroller of Patents.